

LIFE AND TRANSFIGURATION: AN EXPERIMENT
IN MAKING
ARCHITECTURAL METAPHORS

by

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Graduate Students



Project Intent

The intent of this project was to project built forms which share the positive qualities identified in a number of references (photographs and drawings of actual or imagined places.) The method consisted in transforming these source materials in a directed way through a surrogate building process (drawing or modeling.)

Project Summary

The aim of this project was to experiment with techniques for bridging the gap between the qualities--kinds of excellence--which many designers can passively identify in existing environments but which these same designers are incapable of achieving in their synthetic work. Obviously that is a tall order. Stated in that broad way, it is still vague and noble: a sentiment which everyone can probably find some way of affirming. Controversy comes when we get down to the nitty-gritty: what, exactly, constitutes the quality we sense in a particular environment? Could that quality be approximated in another building method, or in another time in a different society? Which places do achieve something worthy of our admiration? What are the best techniques for extracting and refining ore from this rich mine of history and tradition?

Students in the Beaux-Arts tradition were steeped in "the orders" and other paraphernalia of our Classic legacy. It is easy to mock the triviality and compulsiveness of this tradition, but we should not throw out the baby with the bath water. Perhaps we can accept the notion of a rich set of references, a helpful, supportive history, without inheriting the excessive literalness of the Beaux-Arts way of working.

Since the heyday of the Beaux-Arts, architects have

expressed a number of attitudes towards history and the sources of their work; these attitudes range from modernism, a flat rejection of the past, to a personal and poetic romanticism, and now perhaps to a new historicism, one which apes the "dumb" vernacular building. The evidence for this new historicism consists in a number of buildings which mimic the superficial aspects of folk architecture. The architects of these buildings, like the Beaux-Arts student, make the mistake of using their sources too literally, rather than metaphorically. This literal-mindedness is sometimes coupled with a shallow determinism, or "functionalism," which emphasizes the close relationship between physical form, climate, geography and culture, especially in "folk" societies. The result is a lot of buildings which tell us that they bear a simple, direct relationship to a fundamental set of life processes--as the vernacular buildings do--instead of showing us that relationship by actually making it.

Literal-mindedness is a refuge for someone who is either lazy or lacks a well-defined point of view, though in small doses it may be a healthy antidote to notions of complete originality inculcated by the Romantic tradition; it is only really despicable when it is carried to an extreme. But problems result when the relationship of a designer to his sources becomes too one-way. Ideally, a well-formed point of view should interact with a reference and in turn be

somewhat transformed by that reference. In the work, then, we would expect to see the reference transformed by the point of view; if there is a kind of dynamic equilibrium to the process. In the few short weeks of work summarized here, I attempted to transform, rather than transplant my sources, using them as starting points rather than finished products. Several kinds of changes are possible: those of scale, material, color, texture and direction. I have tried to employ as many of these as possible; but in spite of many changes and additions, something always remains of the original source. I have tried to use the references as a leg up, a way of freeing myself from having to invent everything de novo. I never worked with a specific program in mind; that would have been an inappropriate method for this kind of exploration. But in the course of the process I naturally began to see possible uses of resulting forms: function follows form.

Having underlined the importance of a point of view, a bias, if you will, to the process, I should make some reference to the attitude which shaped and directed my work with these sources (and which, indeed, selected the sources). The reason for developing a way of working is to get out of the bind of always having to make personal, idiosyncratic decisions, to find a tool which can accomplish more than you could ever think out bit by bit. So a reasonable working method would seem to be one which did not require that everything "fit" together perfectly, one that

accepted, even encouraged, overlap. Otherwise one gets back into the business of being a great artist, or at least a slow-working tailor. If buildings are precious and fit together perfectly, then they are destroyed by change and growth. If space is packed or totally filled, then the volume quickly reaches a hard limit which cannot be violated or encroached upon by later growth: a capsule is a completed thing. Capsules can only add up as single units; they cannot grow and form larger entities because they do not have a form which suggests that they are reciprocal or incomplete. Capsules have their uses, but those uses are quite specific and generally involve the isolation of hostile elements. The prevailing "bias" is towards reciprocal, partial ways of defining space; it is against close-packed conditions and for loosely built lattices which might grow at the same density without suffocating existing built space. Naturally, monolithic building methods are not encouraged by this point of view. The emphasis is on a rich vocabulary of building methods, multiple methods deployed in a variety of relationships to each other. This attitude finds an important reference in the natural landscape. Natural boundaries do not tend to be hard; definitions tend to be partial; many kinds of definition are always present; prevailing directions are acknowledged and accommodated directly, and so on. So, in brief, that is the attitude which has influenced the decisions I made in

the work shown here. (For a discussion of these and related issues at greater length, see Alfred Sanford, M.I.T. B. Arch. Thesis, 1968 and Sanford Bond and Robert Slattery, M.I.T. B.Arch. Thesis, 1970.) Clearly, this attitude is in opposition to the mainstream of contemporary architectural practice; it sets itself squarely against the kind of cellular organization which characterizes most new buildings. Hopefully this attitude will be apparent in and somewhat more specifically defined by the drawings. Better the demonstration be somewhat ahead of the explanation than vice-versa.

The projections began from the Mexican materials, primarily from the pre-Colombian pyramid forms at Zacaleu, Guatemala. It was originally intended that in the course of 12 weeks I would make a number of separate projections based first on single sided ground forms, then on a linear framework, then on a planar assemblage, and so on until I could begin to put them together. The actual process was abbreviated and telescoped, so that the work, while it gets beyond the ground form, consists of a single progression of transformations of the original reference at Zacaleu. After working mostly with perspectives for several weeks, I began trying to understand what the section might be like. After several attempts I decided to work with a simple, large-scale structural framework which in its basic disposition suggested the terraced quality of the

projections. This decision led me to several projections in which smaller, variegated kinds of definition encrusted a simple, crude set of huge platforms. Through criticism of this proposal I began to see that this basic structure should itself have the kind of dimension that would make it habitable. So I began to work with large trusses which were open enough to allow internal use. In order to facilitate further work, I arbitrarily defined a set of conditions which would give me directions to work with. So I defined a rough geography for the site, directions of automobile and pedestrian movement, light, etc. I then defined a plan for the larger platforms and drew sections through several places in that plan, incorporating the smaller definitions which would encrust the "megaforms." The final drawings are attempts to see parts of this structure more concretely.

The results are sometimes strange and forced, but these, like short-lived hybrids which result from cross-breeding, are the results of an open experimental process. They are instructive, moreover, by helping to show more clearly in the midst of the process what the excellence we can recognize but not necessarily reconstruct consists in. Quality does not consist in pure nervousness or excitement any more than it does in military orderliness; it is the result of a unifying element (or way of working) which organizes a great number of parts. Things die of too much unity or too much variety.

Sources

The following photographs represent sources, references, for the work done in this project. The first photograph, it can be seen from the drawings, represents the original reference and is the starting point for most of the drawings. The first 14 photographs are of places in Middle America, and after the plan of Xochicalco, the plan of an Indian city is the transition to photos from a variety of other places in Japan, Europe and this country. There is a rough progression in the photographs from the ground forms of Mexico and Guatemala to linear fields, both natural and man-made.

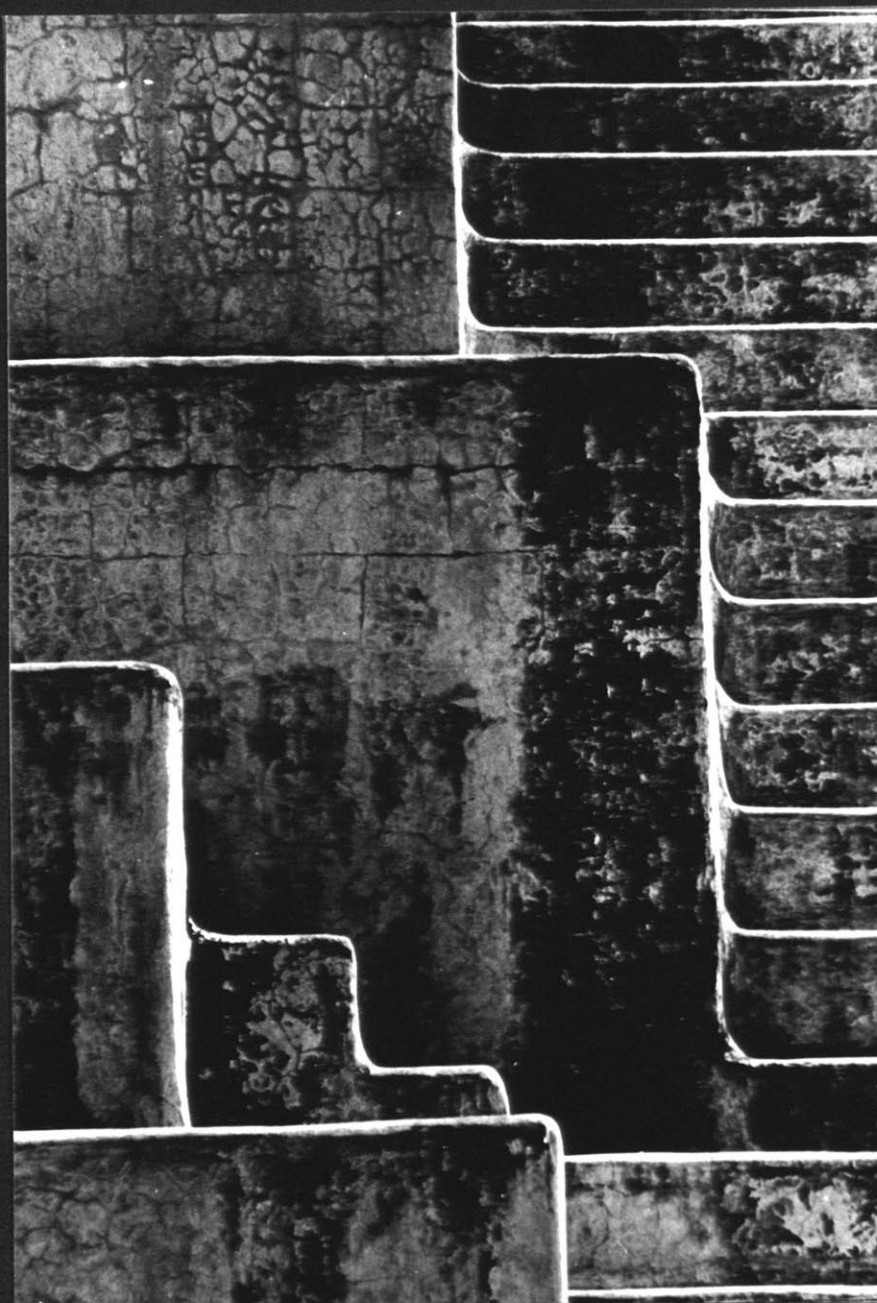
Photographs

- No.'s 1-5. Zacaleu, Guatemala. The only Middle American site where the stucco facing has been totally restored. From Norman F. Carver, Silent Cities.
6. Monte Alban, near Oaxaca, Mexico. Ceremonial site on a levelled-off mountaintop. From Carver.
- 7-11. Palenque, Chiapas, Mexico. One of the most beautiful Mayan sites, "poised like an unshed tear" (as one explorer put it) at the edge of the Chiapas mountains. Photos: 7, 8 & 10, Tilly; 9 & 11 from Carver. The last photograph shows just the roof comb--made with limestone and mortar--on the top of a temple.
12. Mitla, near Oaxaca. Carved mosaics. From Carver.
13. Uxmal, Yucatan. Mosaics made up of mass-produced blocks of limestone. From Carver.
14. Plan of Xochicalco, Mexico, another hilltop site.
15. Plan of an Indian City from Klaus Herdeg, Formal Structure in Indian Architecture. This was the primary reference for an exploration similar to mine done by Motoo Kubo (M.I.T. B. Arch. Thesis, 1971.)
16. Concrete work in garden of Venetian building restored by the Italian architect Scarpa. From Zodiac 13.

Photographs (ctd.)

17. Interior shot from restoration by Scarpa.
- 18-19. From Form and Space of Japanese Architecture,
by Norman F. Carver.
20. Bethlehem Baptist Church, Los Angeles, by
R.M. Schindler. From Esther McCoy, Five
California Architects.
21. Sachs apartment house, by Schindler. From
McCoy.
22. Balconies and fire escapes. Photo: S. Bond.
23. Fishing rig, Wisconsin. Photo: Tilly.
24. Construction by Eiffel. From Zodiac 13.
- 25--26. Bridges by Eiffel. From Zodiac 13.
27. Superimposed fire escapes, effect of linear
screen. Photo: S. Bond.
28. Directional linear fields, natural and man-
made. Photos: S. Bond.
29. Multi-directional linear network. Photo:
S. Bond.













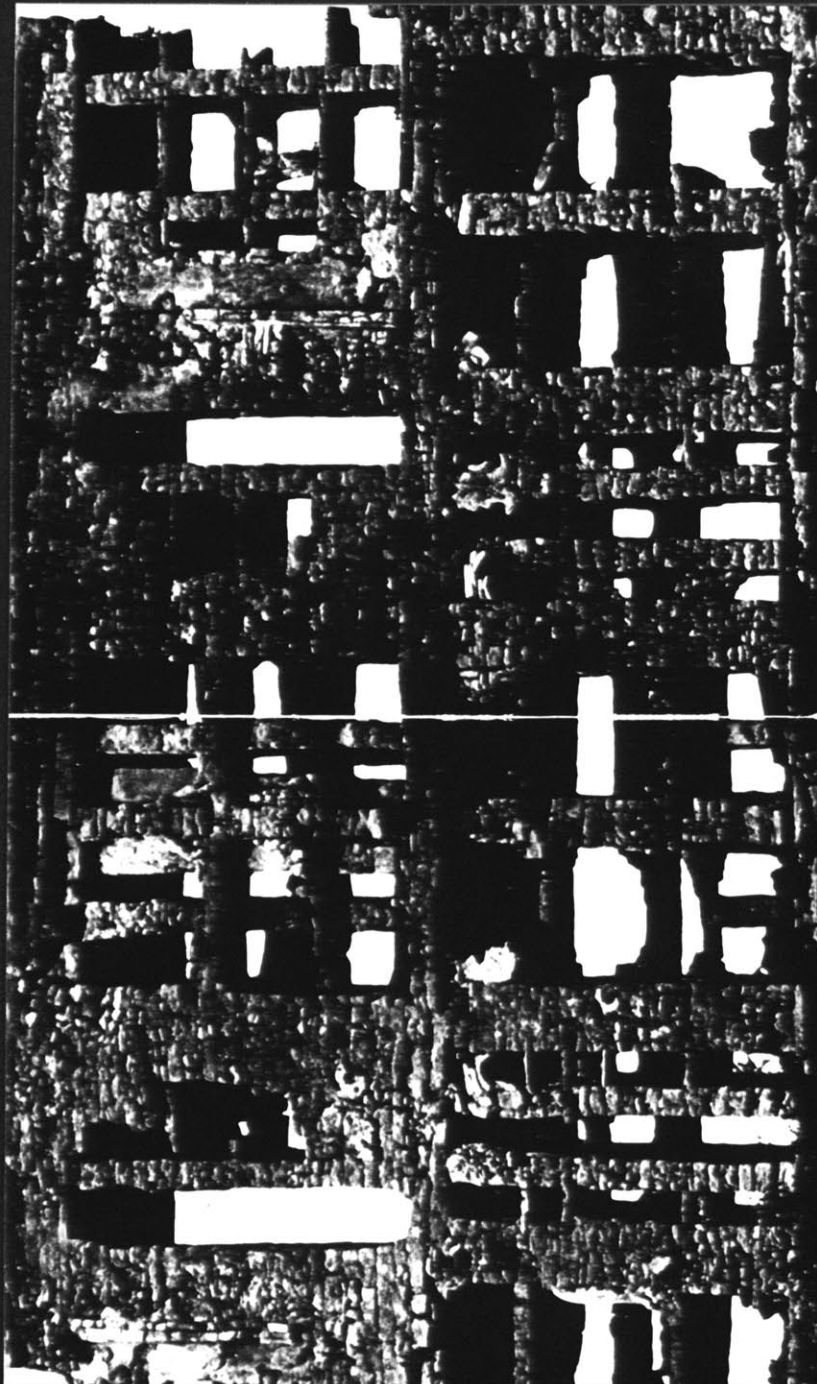


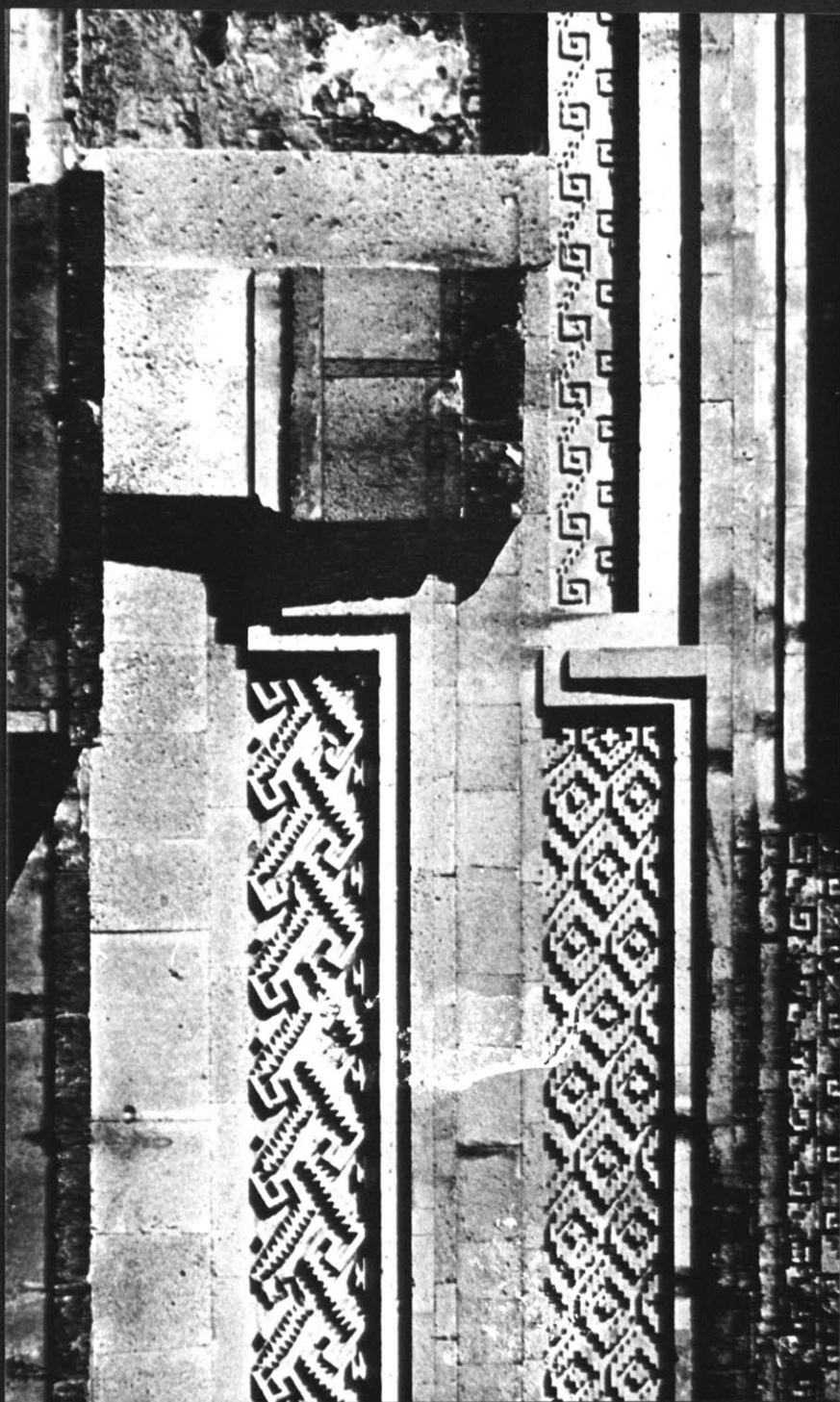


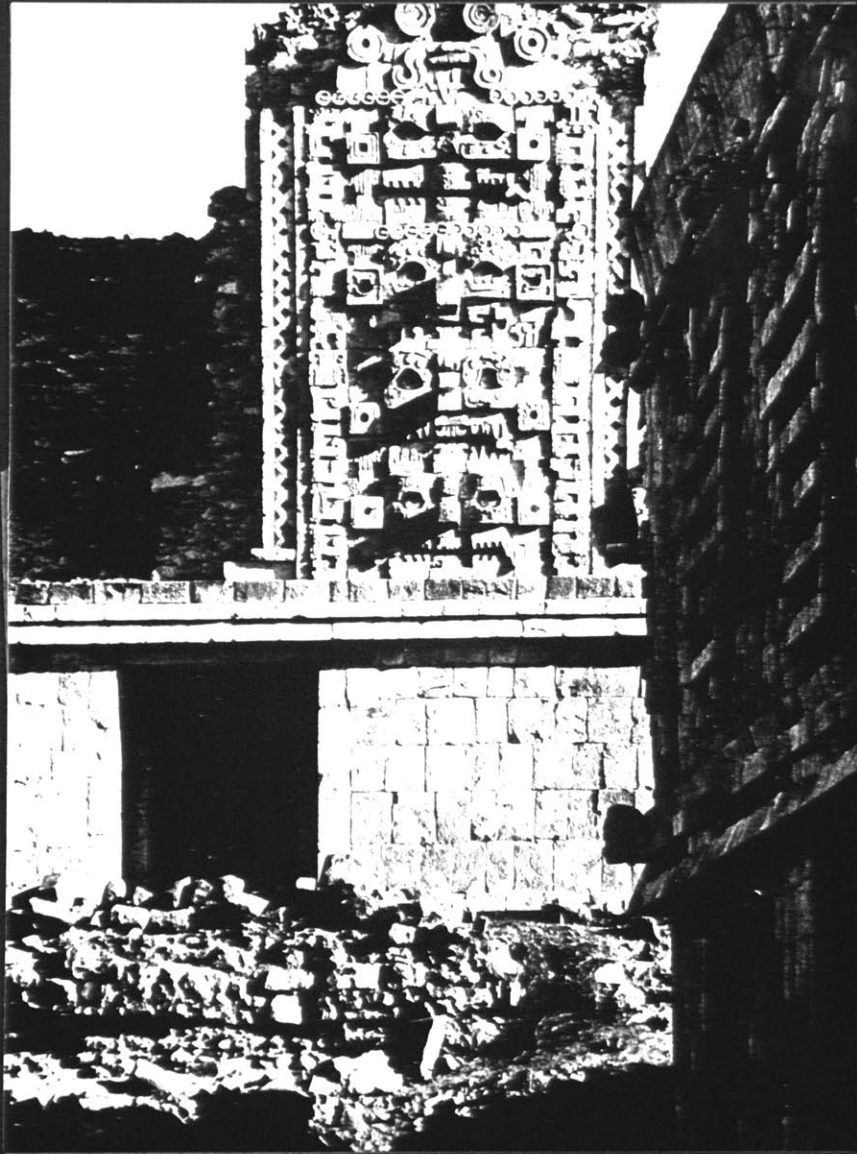
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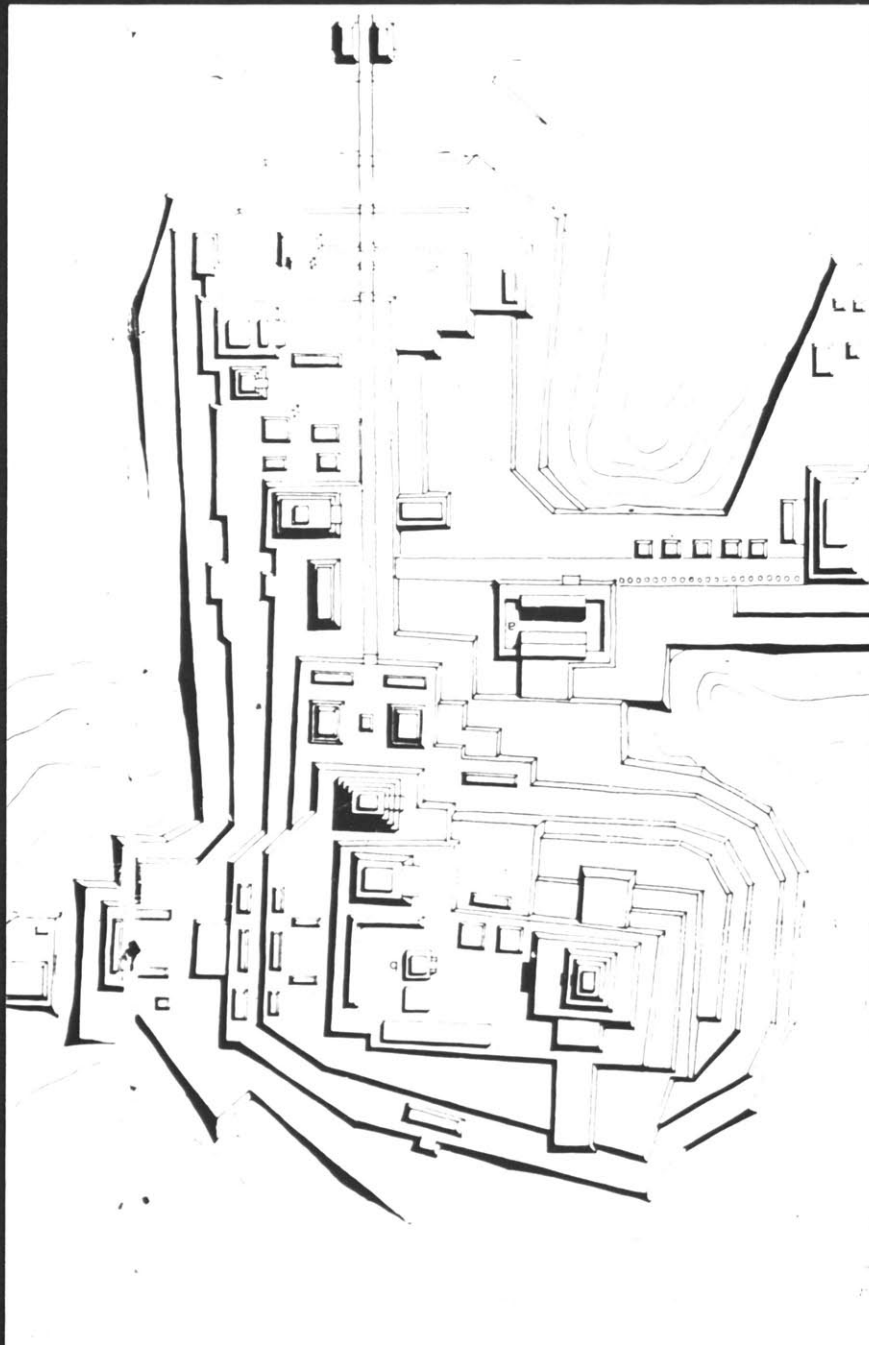






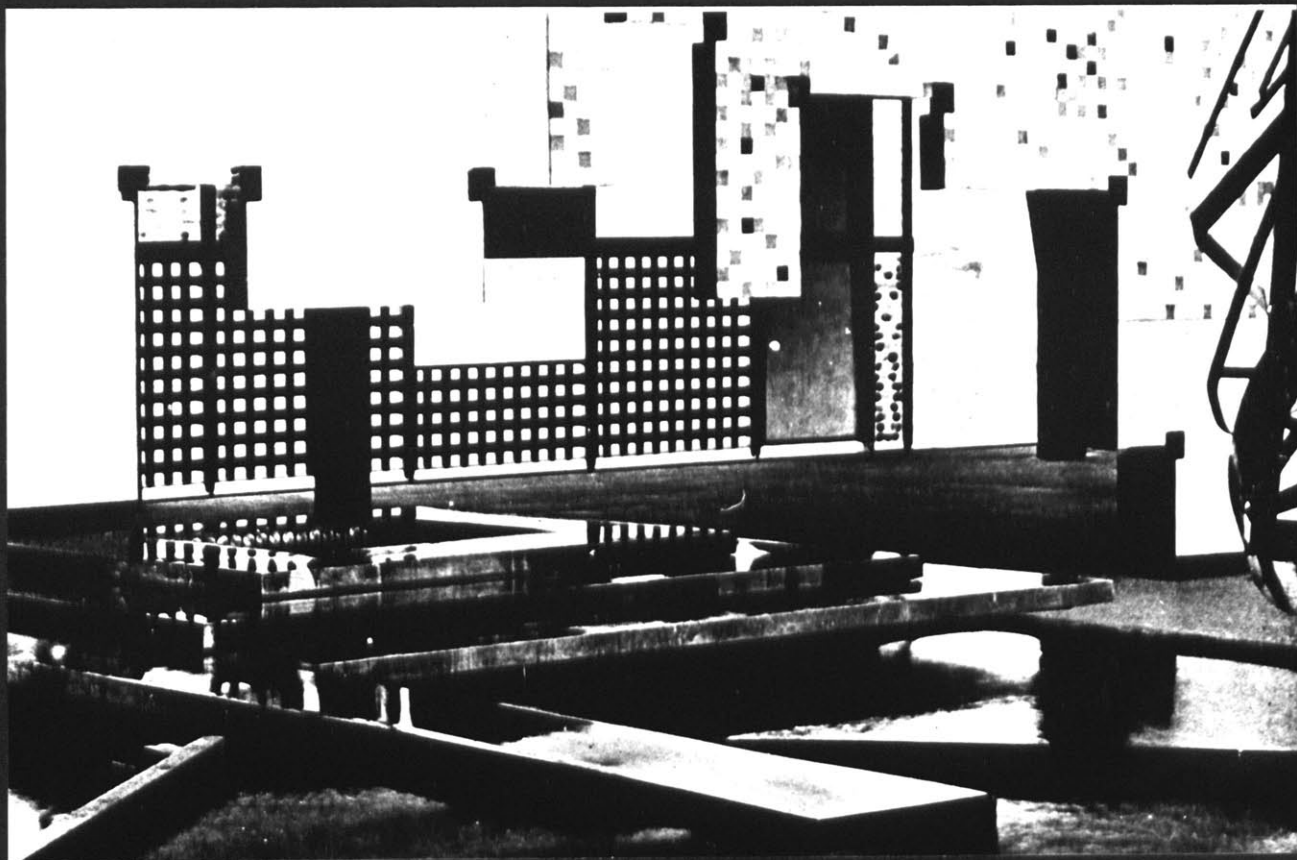


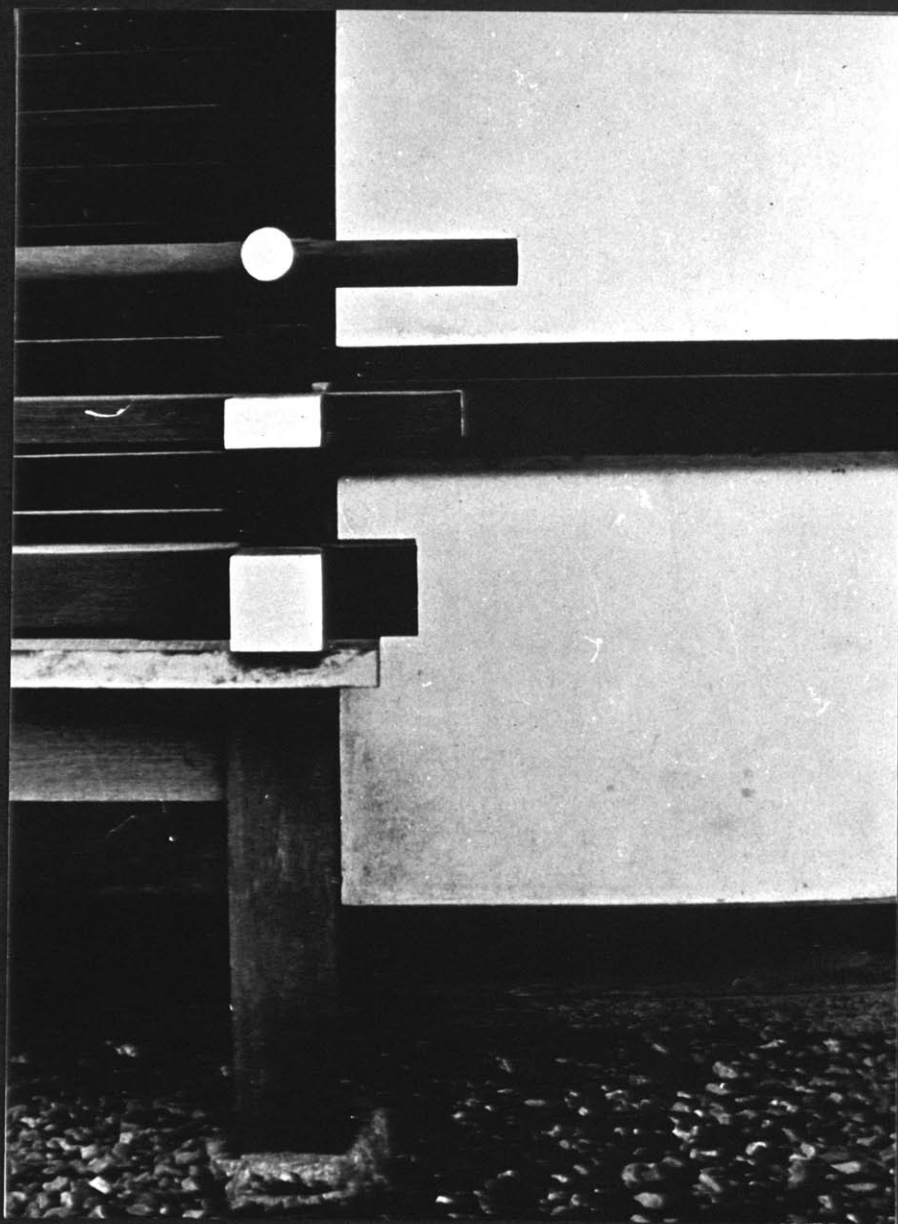


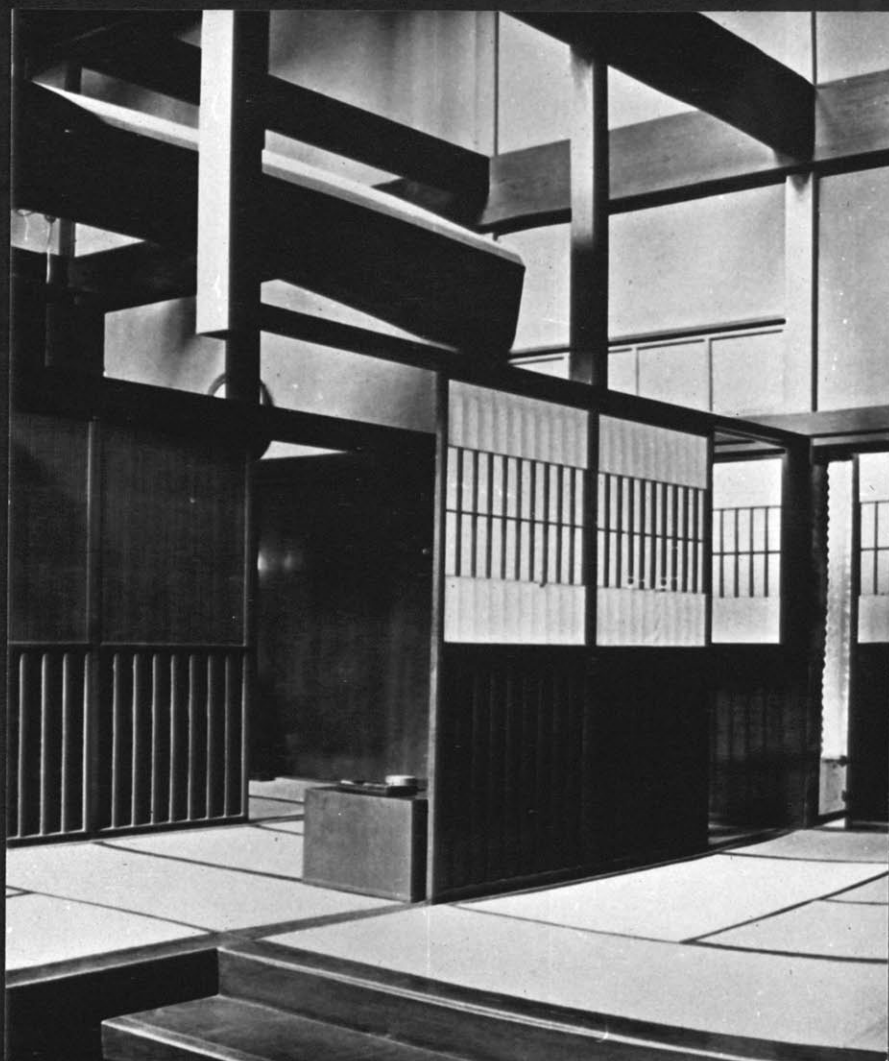


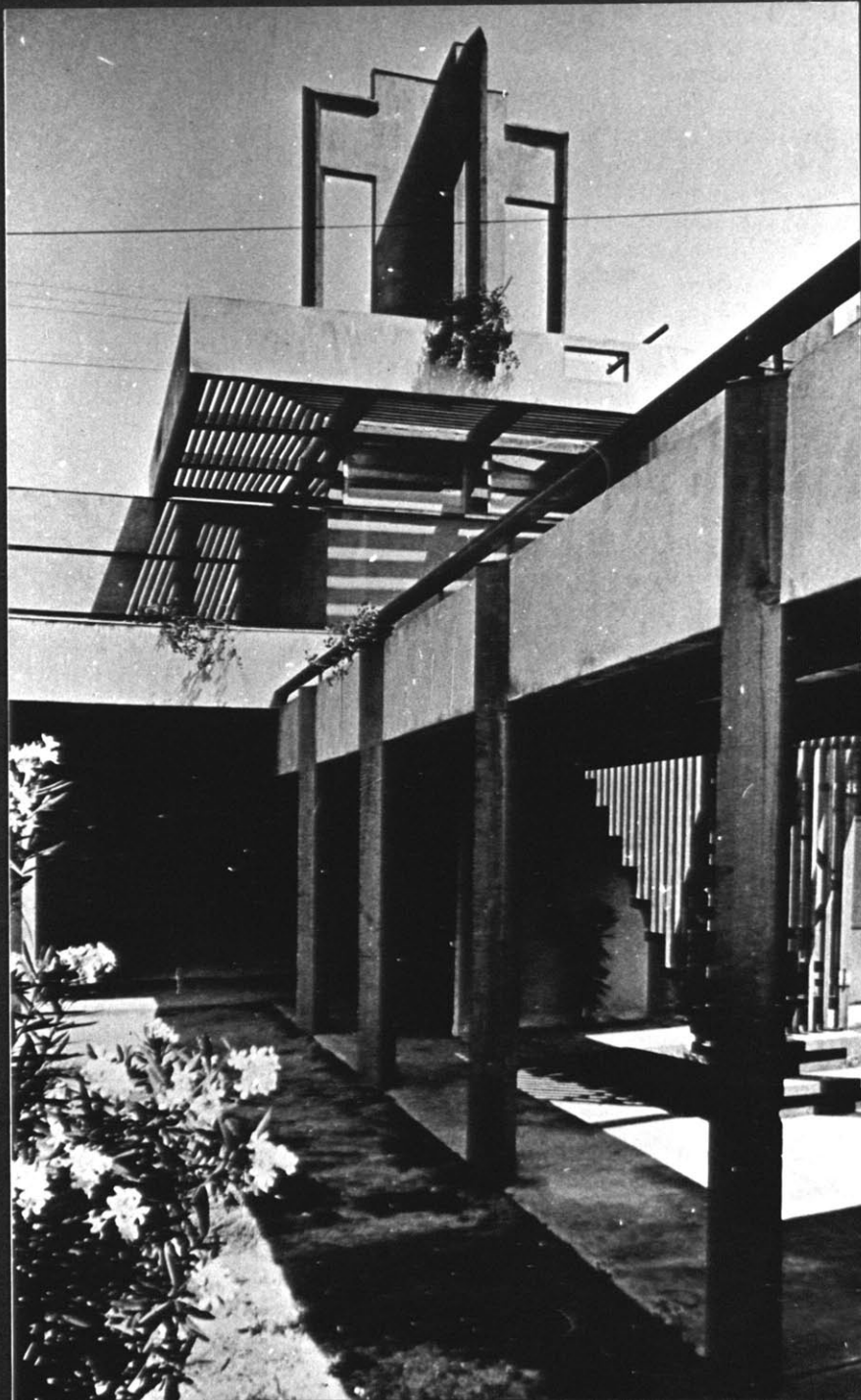




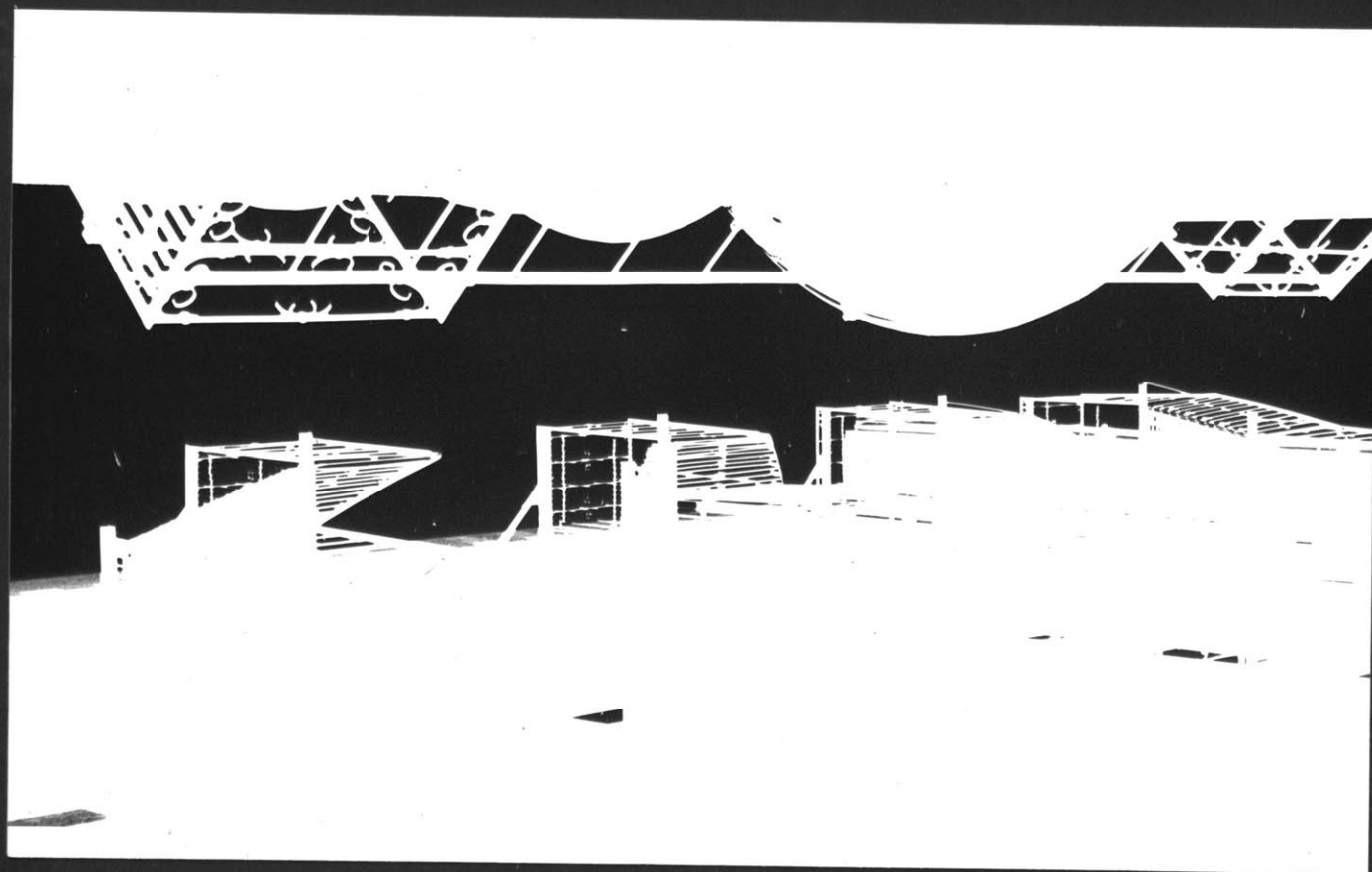


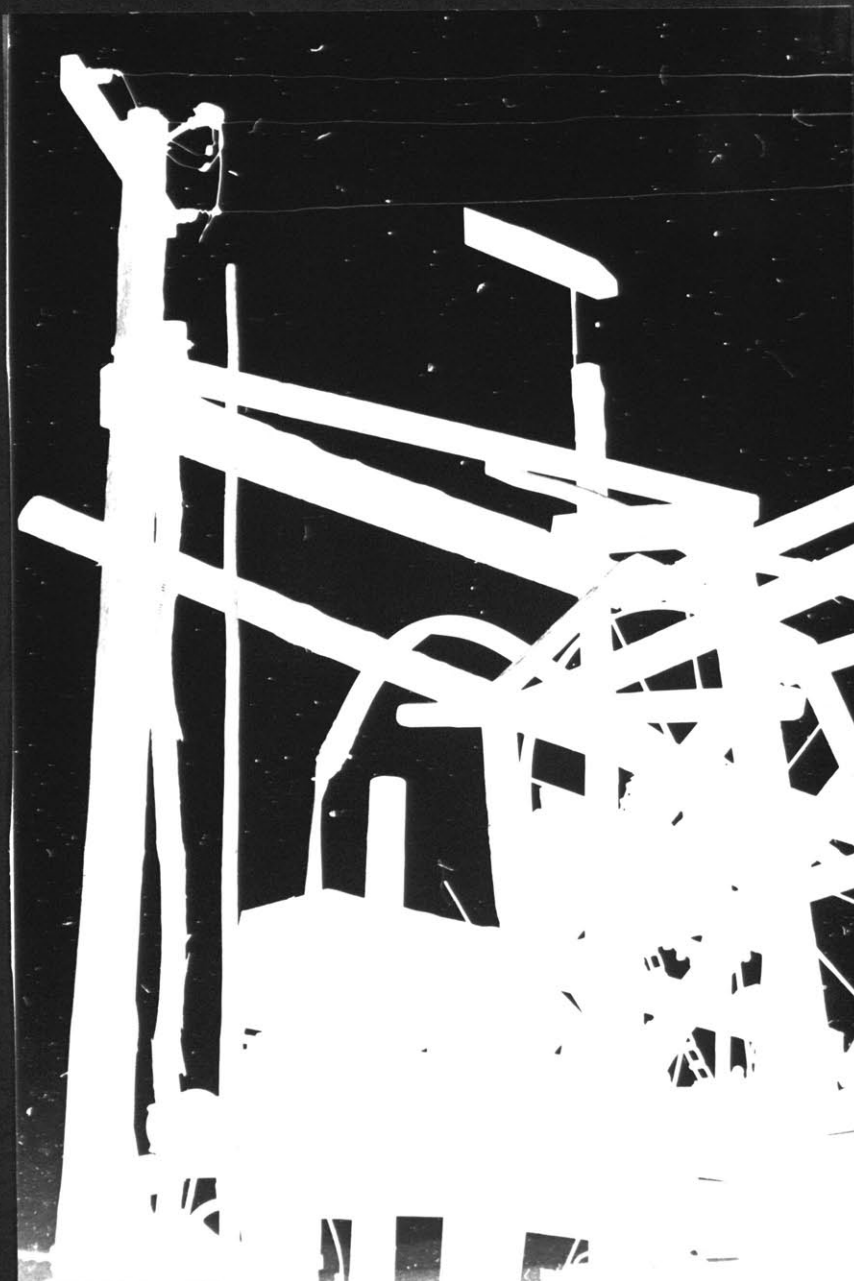




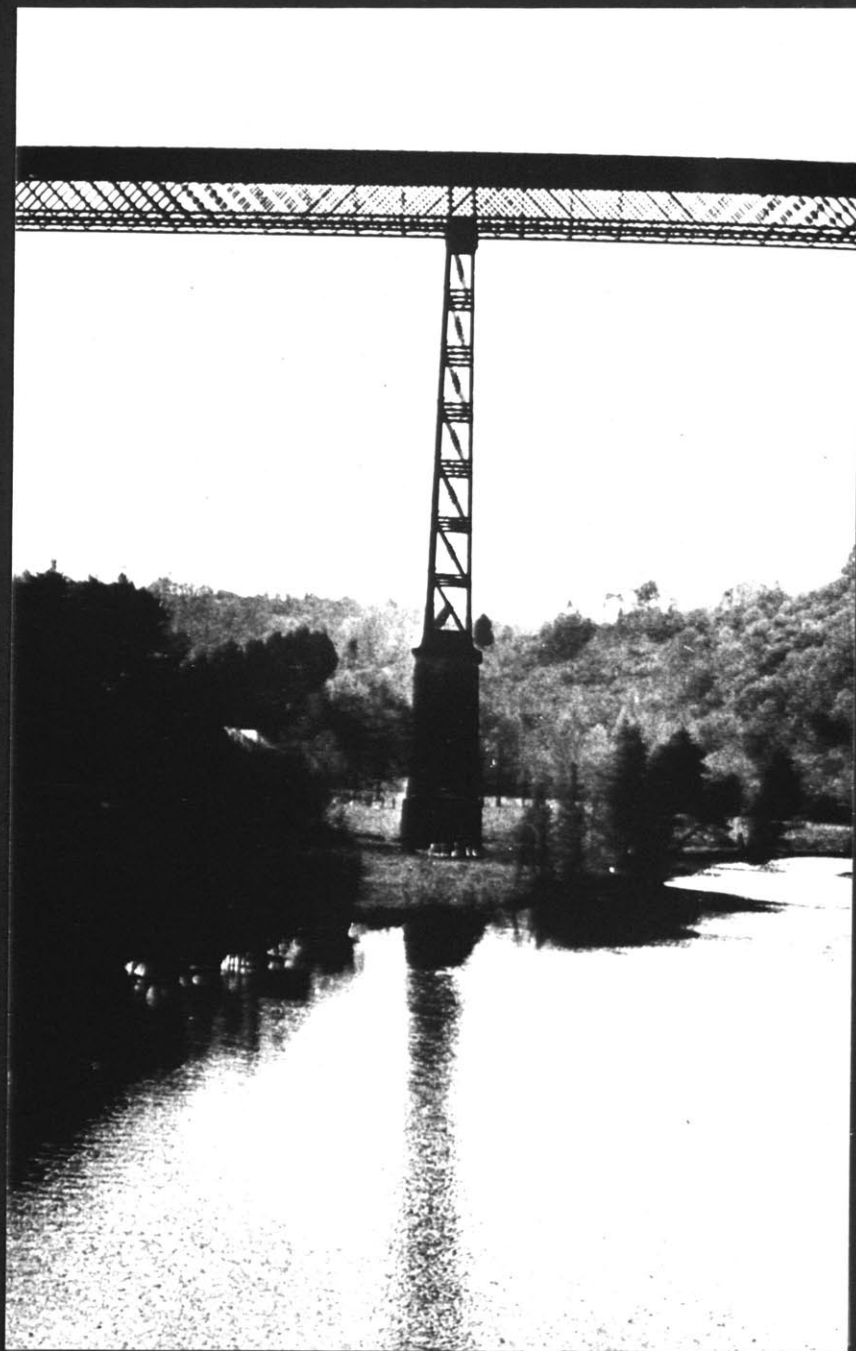


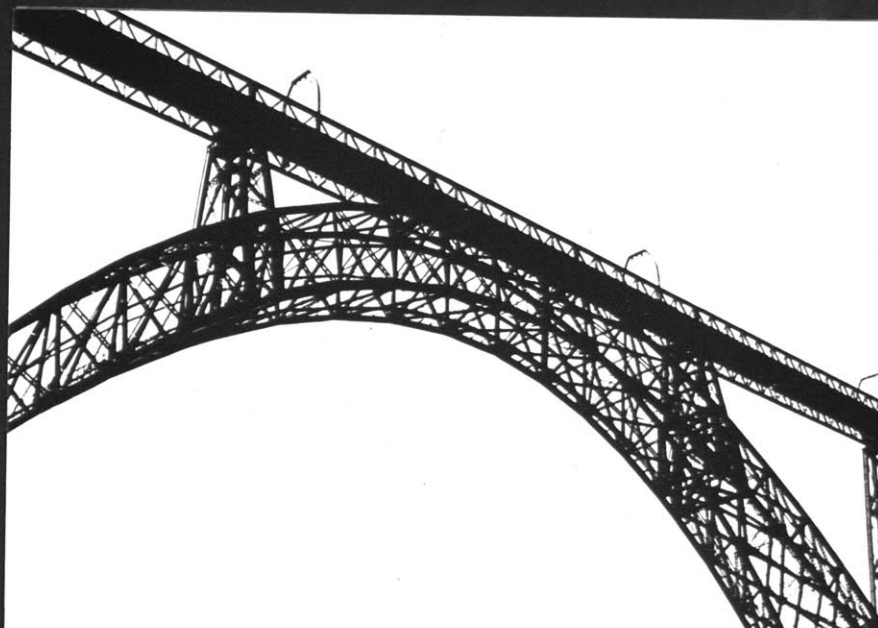








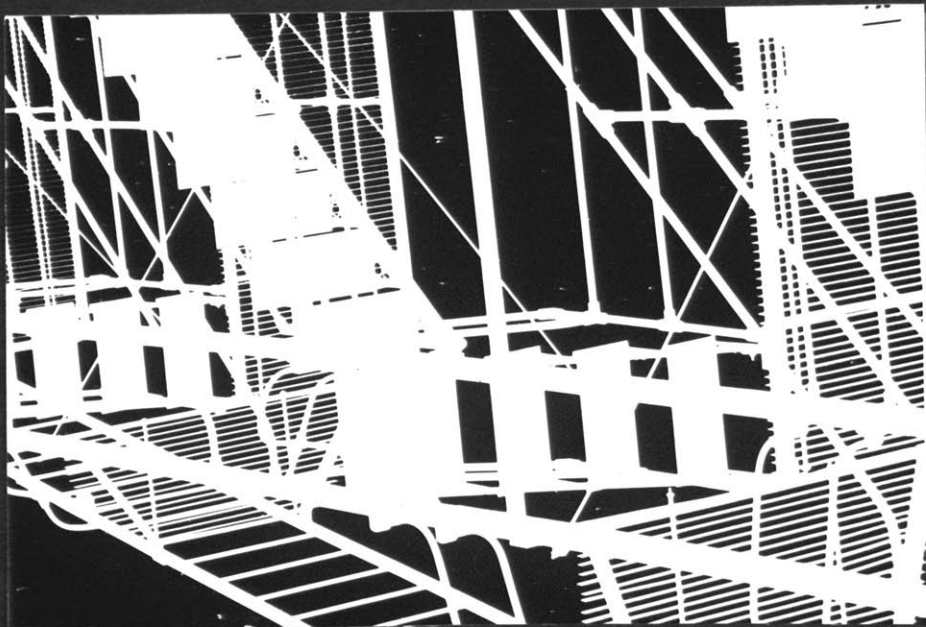




- 49. Uno dei due piloni insistente sulle reni dell'arco.
- 50. Piana e prospetto del viadotto del Garabit.
- 51. Dettaglio costruttivo della parte centrale del viadotto del Garabit.
- 52. Il Garabit, guardando verso l'attacco nord.
- 53. L'attacco delle cerniere dell'arco sulla base in muratura.
- 54. La zona centrale dell'arco.

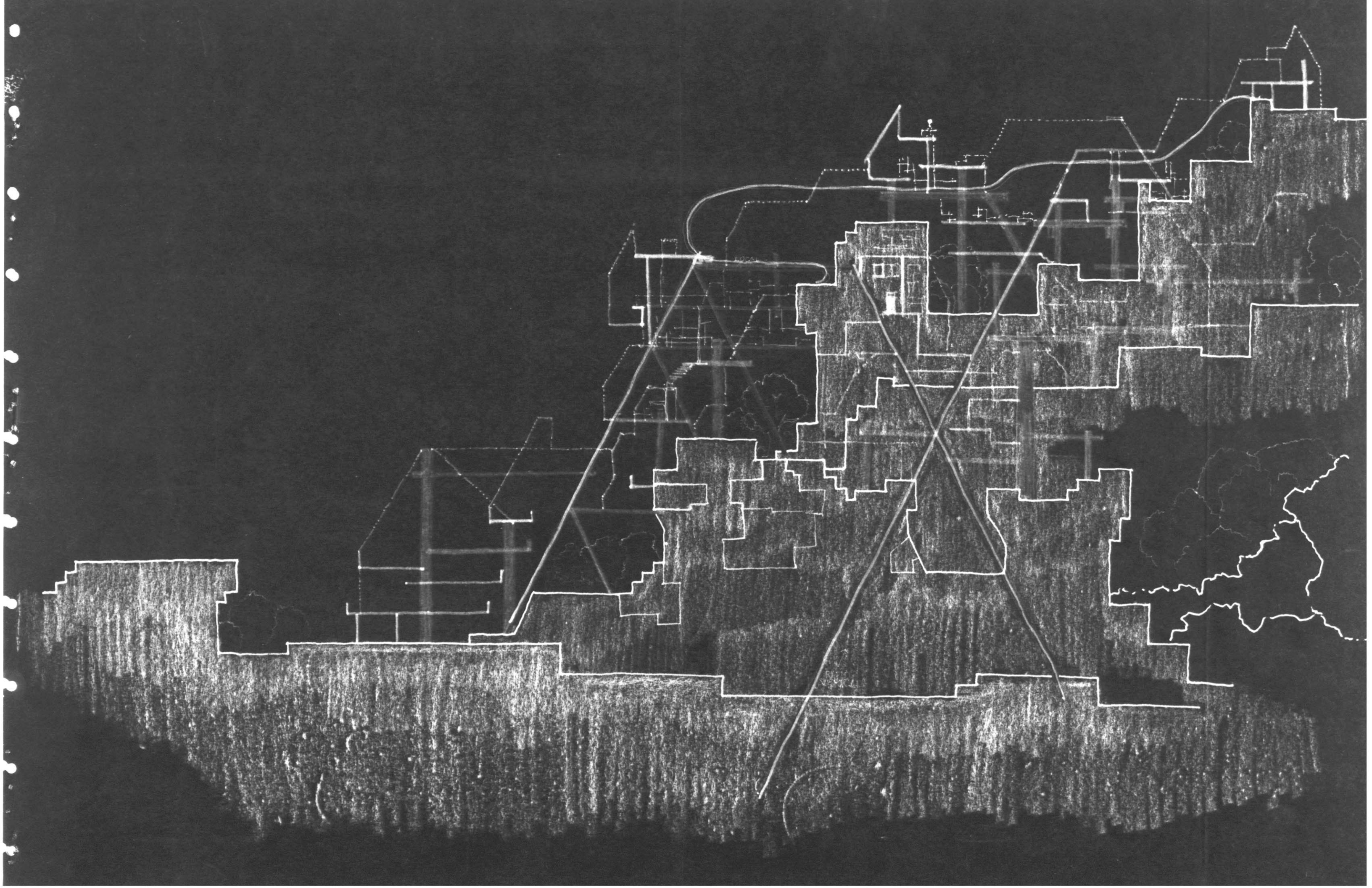


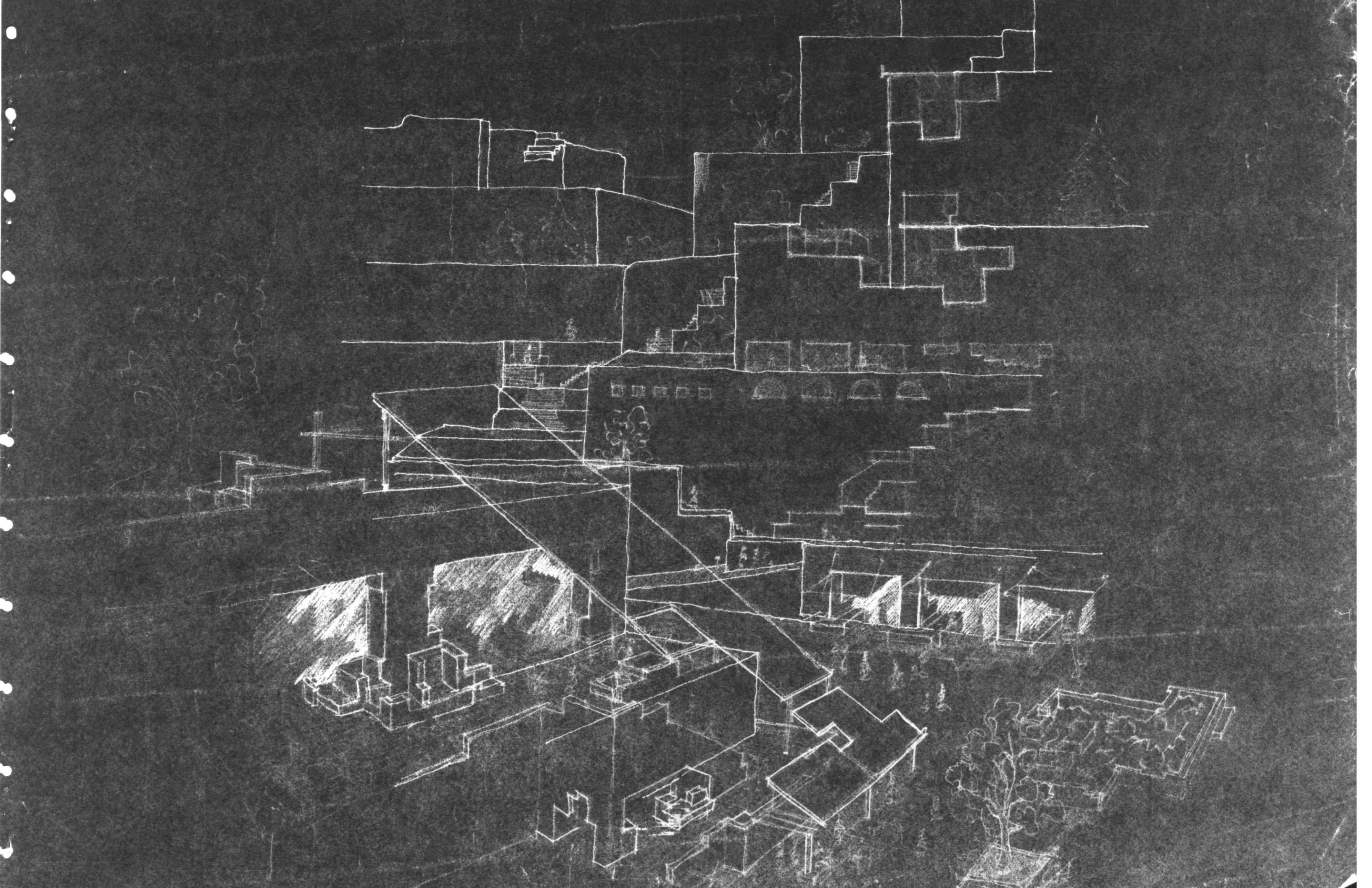




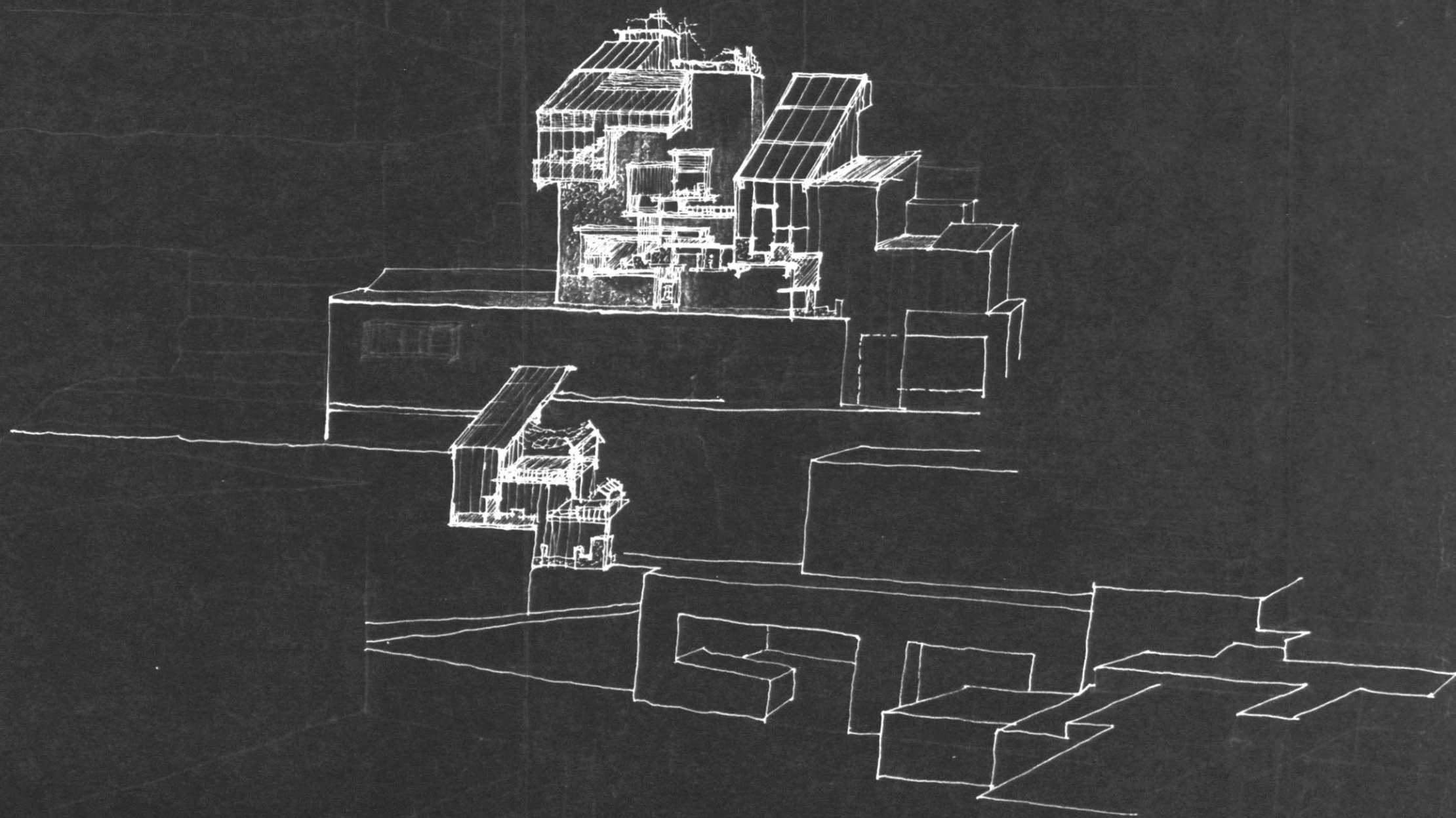
Drawings

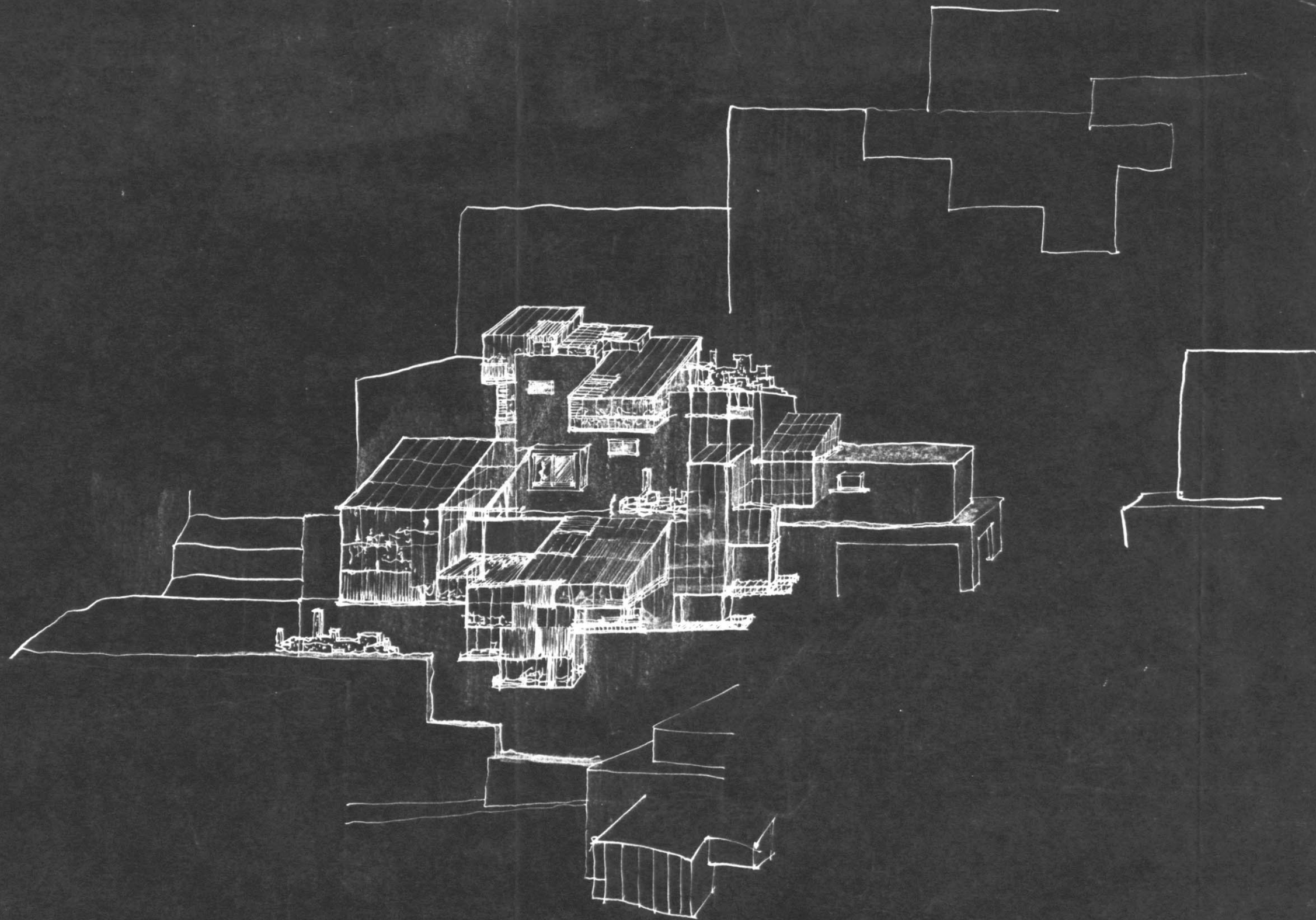
The course of work which these drawings represent is discussed in the summary. Unfortunately the blueprints do not have the quality of the original sepias. Places where color was used on prints show up merely as scratched areas, and other blemishes result from the reproduction process itself.

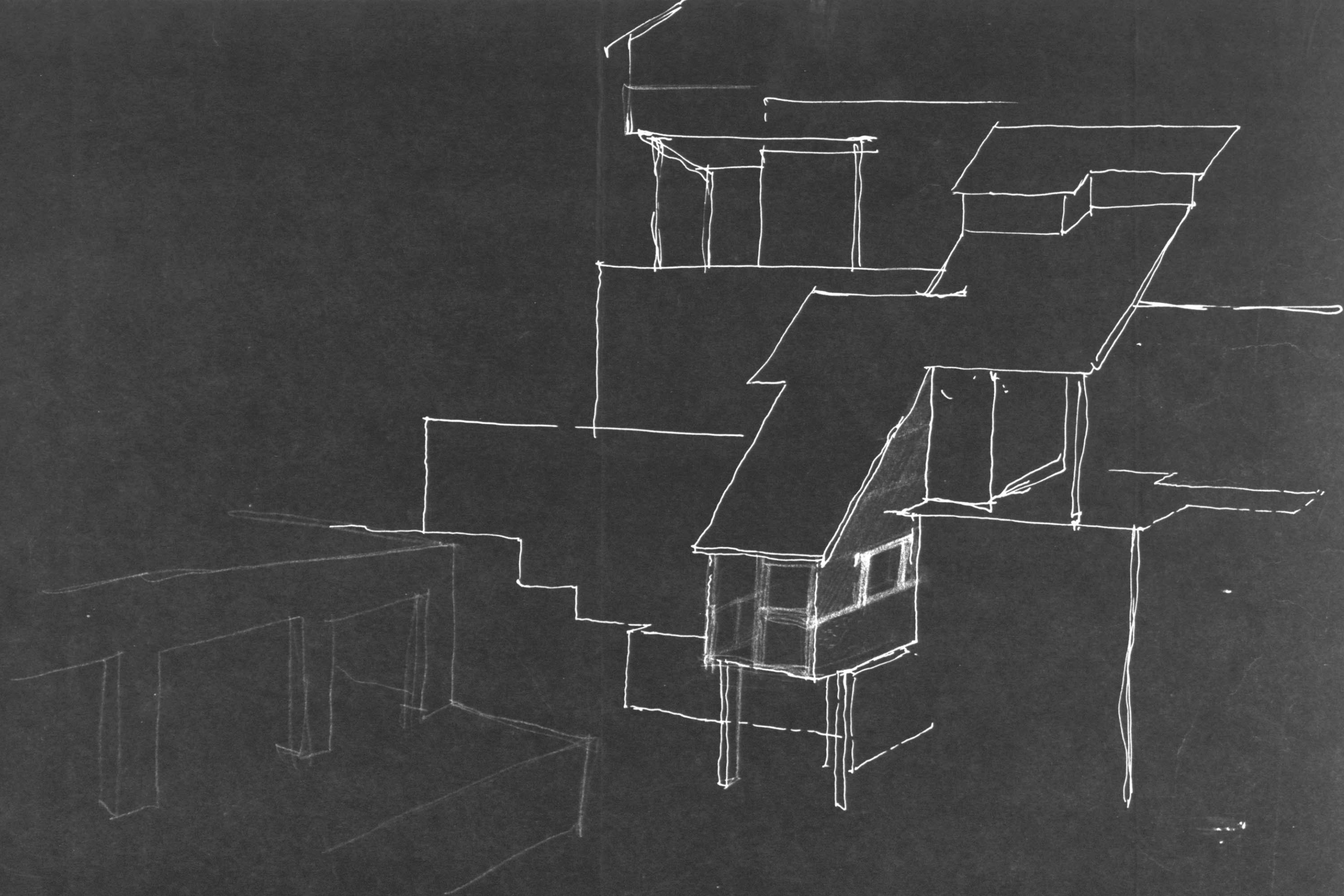








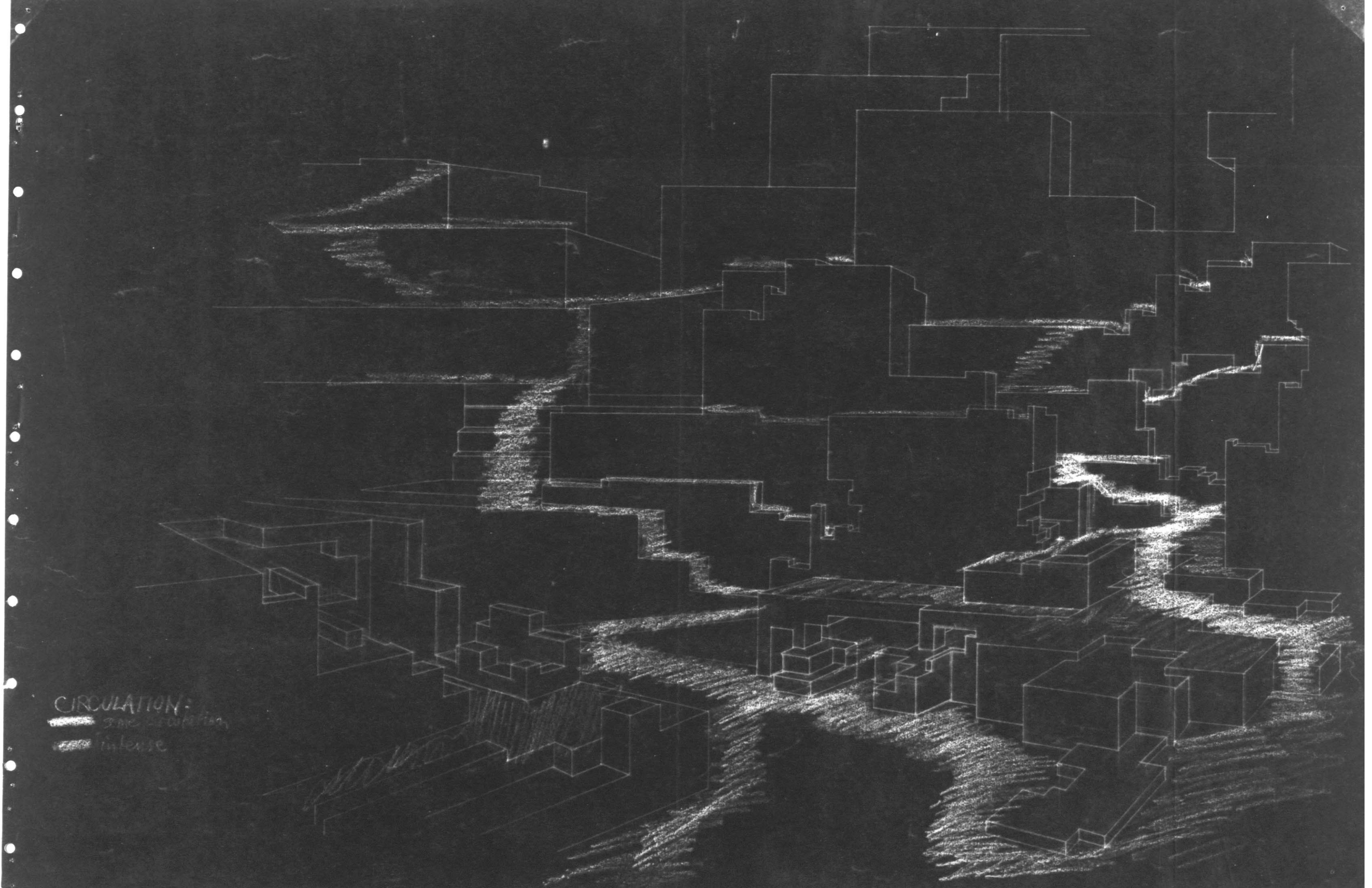




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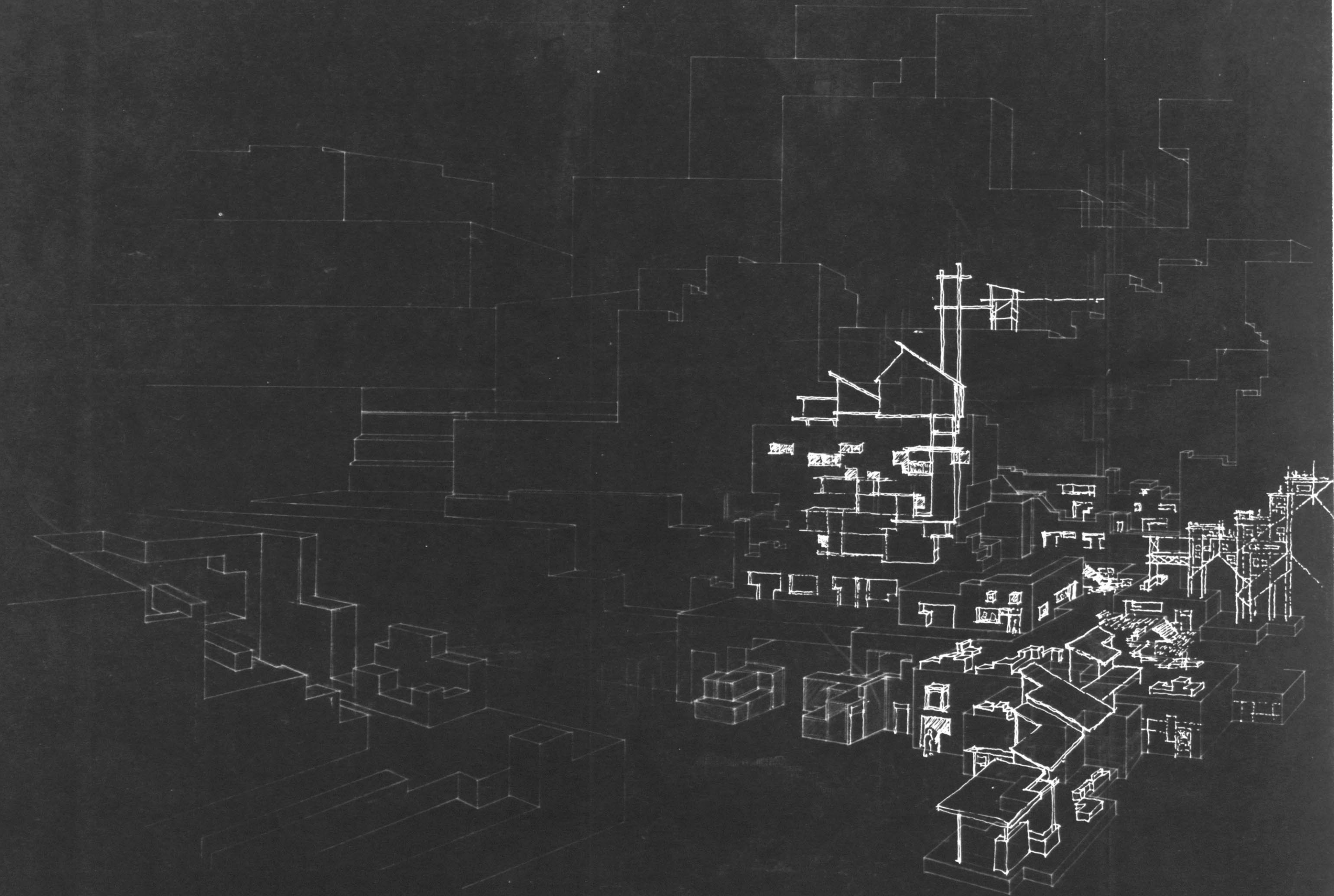
 3rd circulation

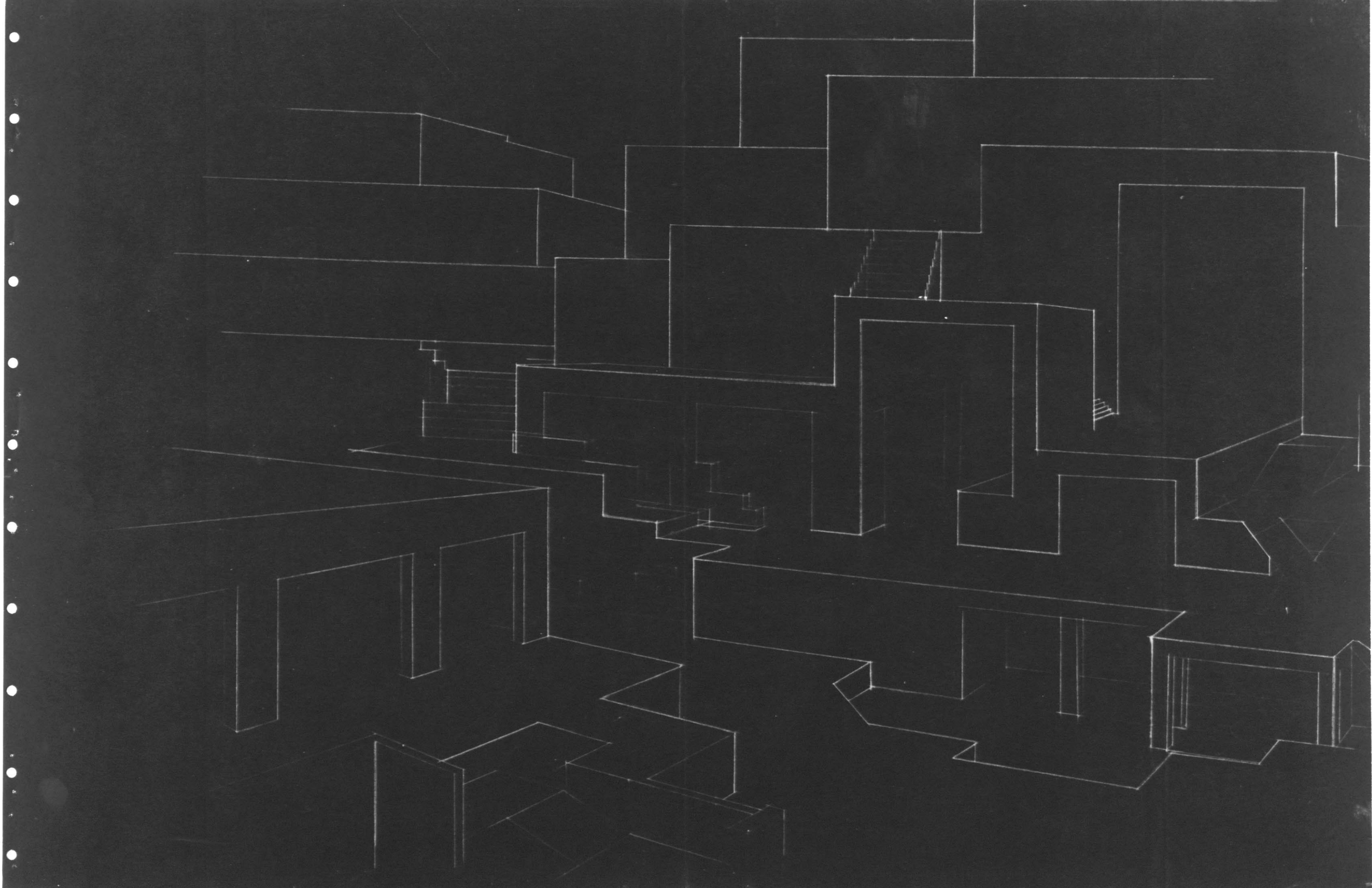
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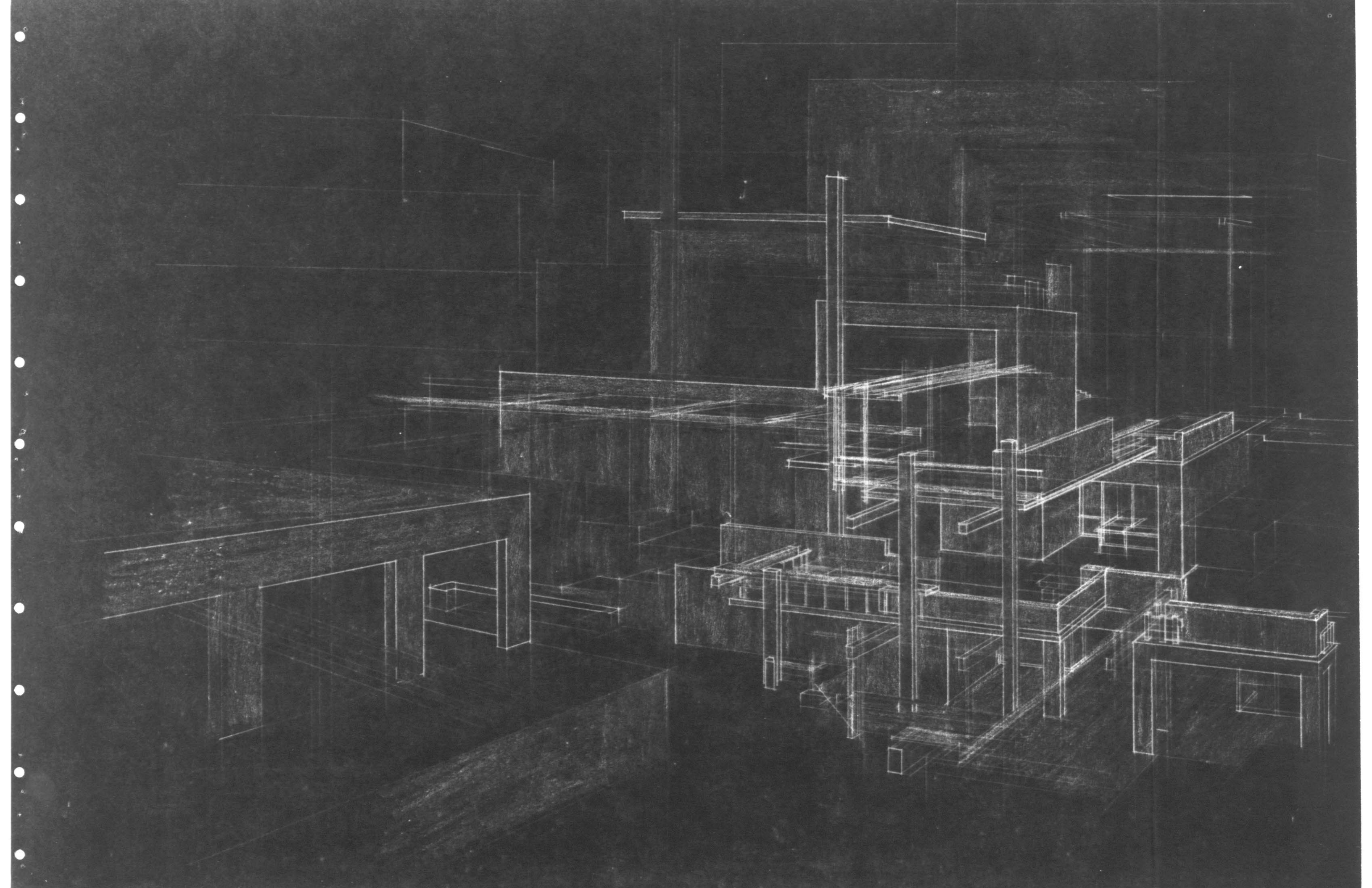


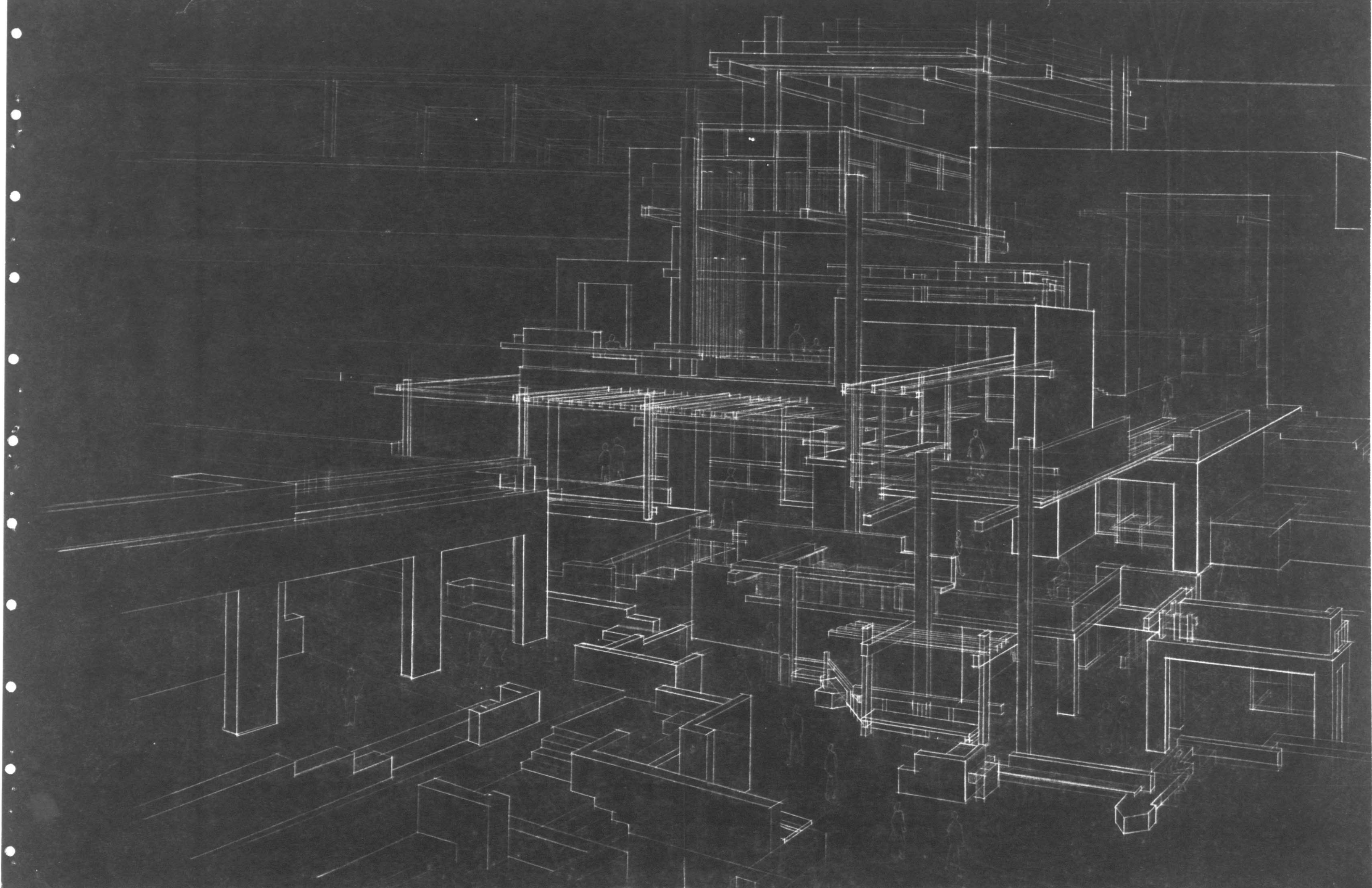


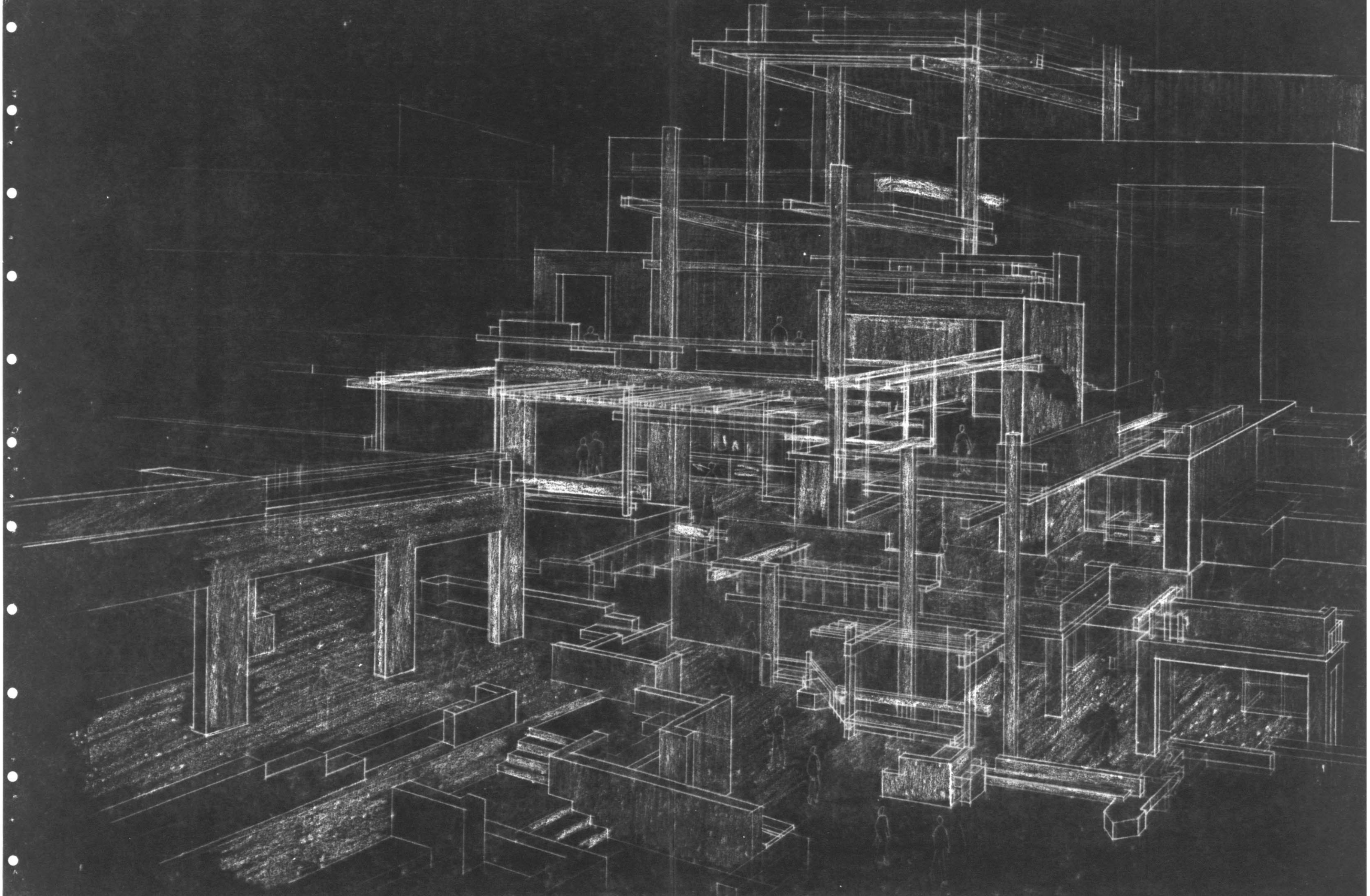


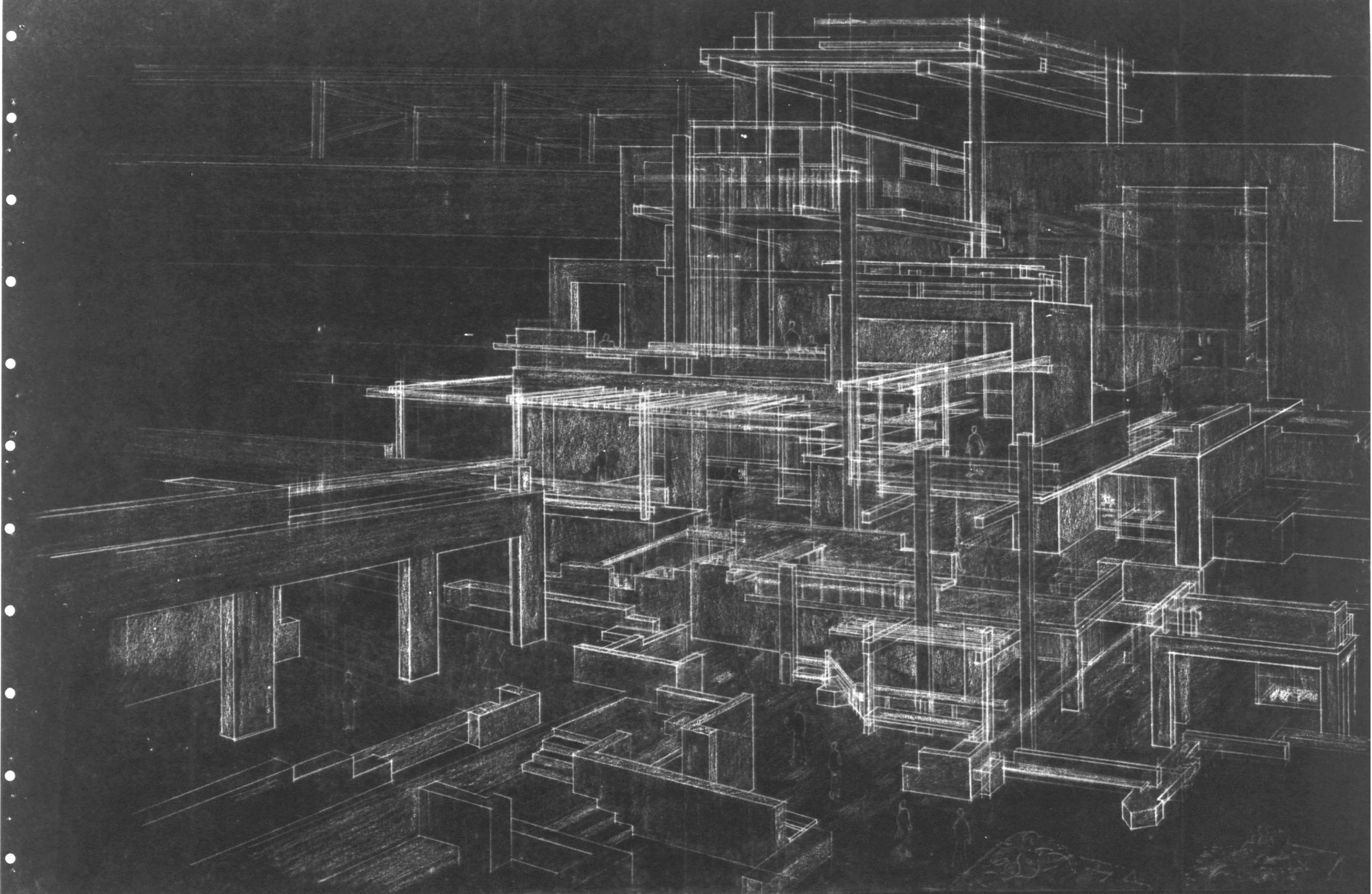


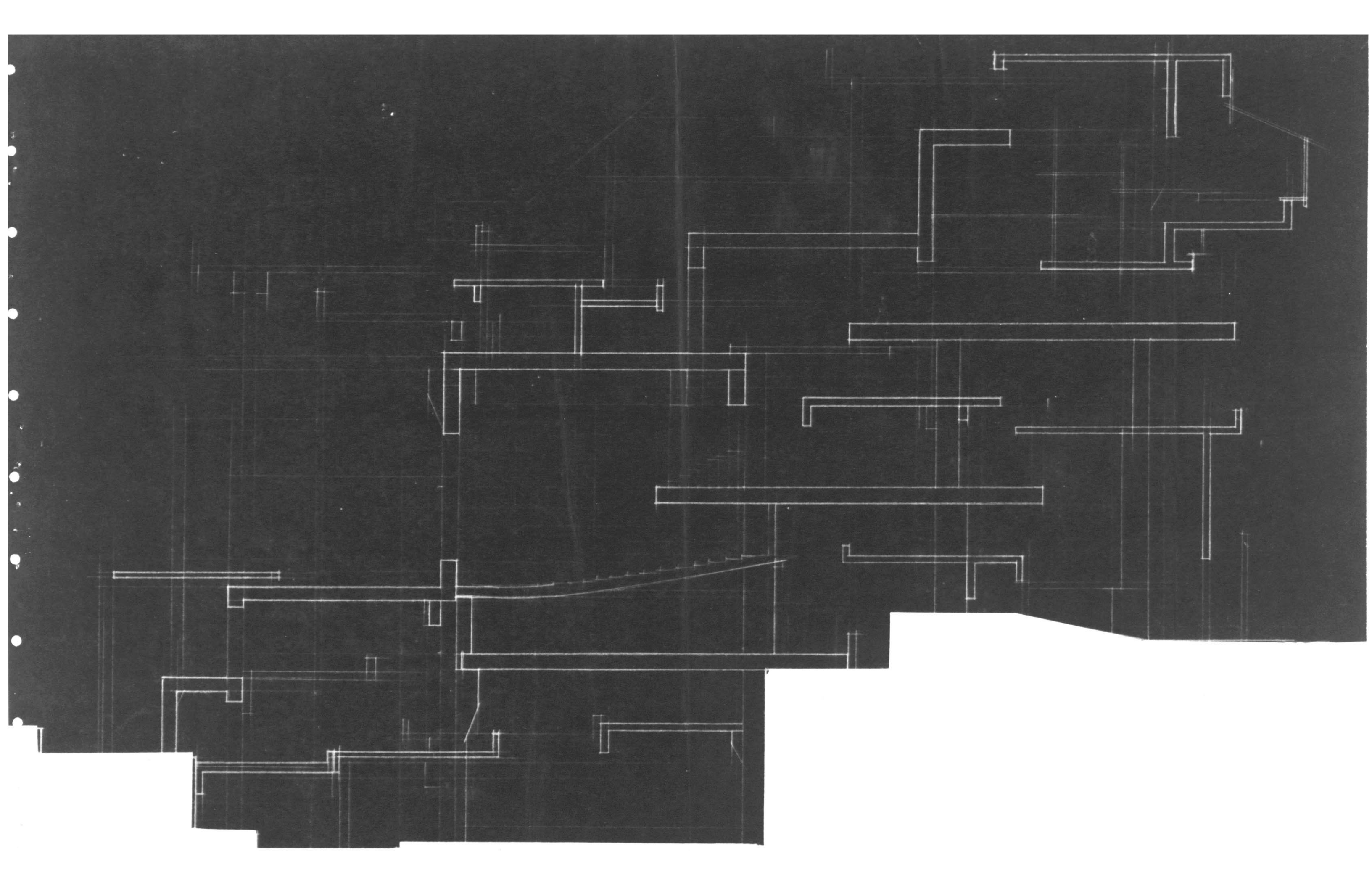


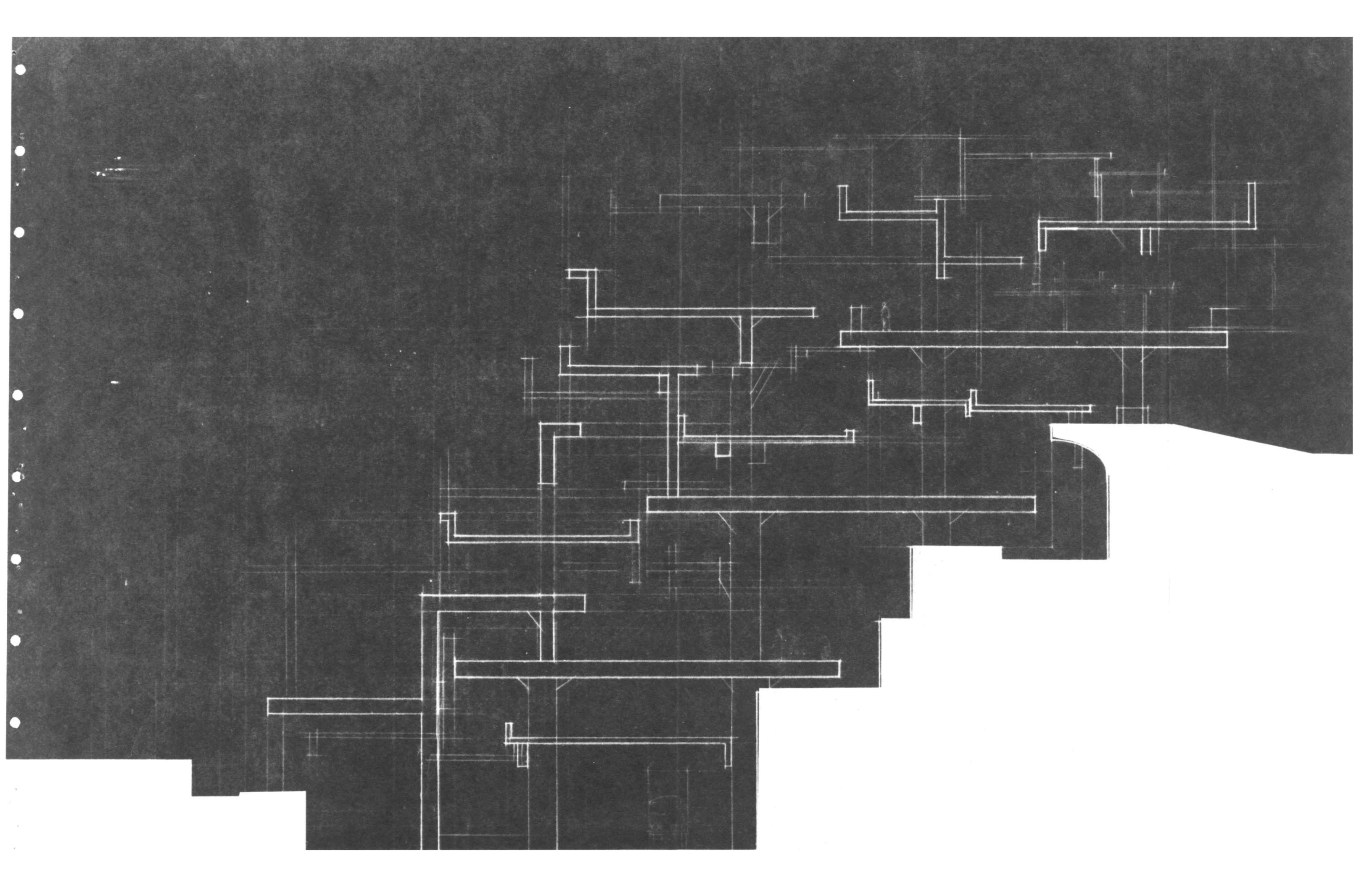






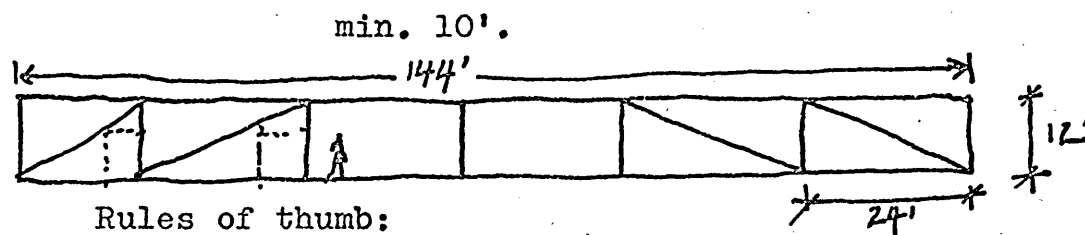




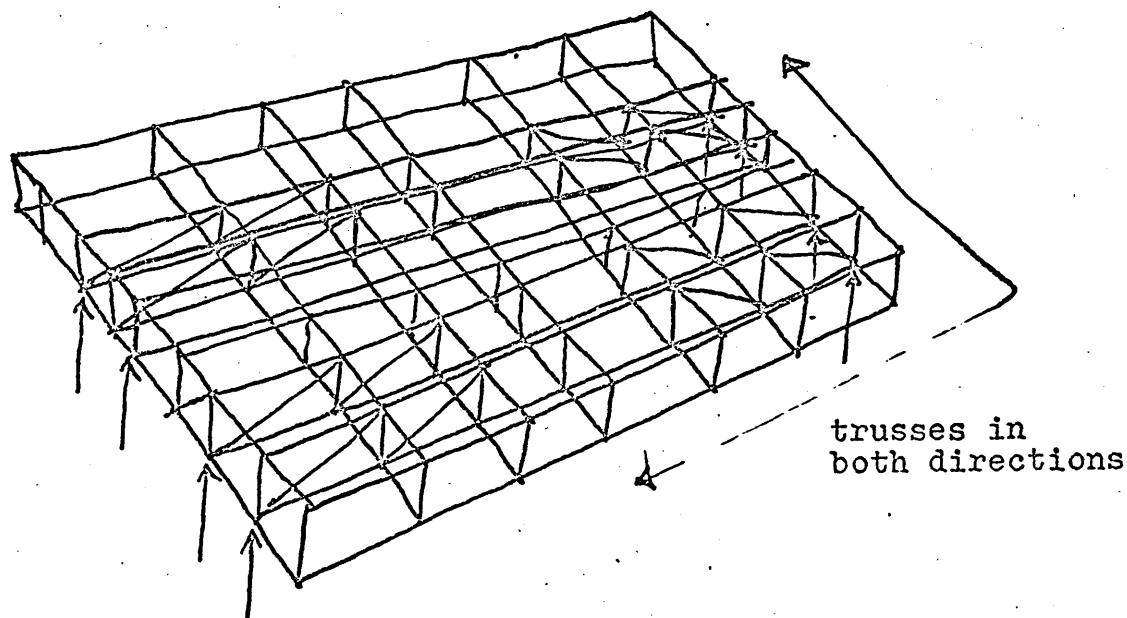


Structural Non-System

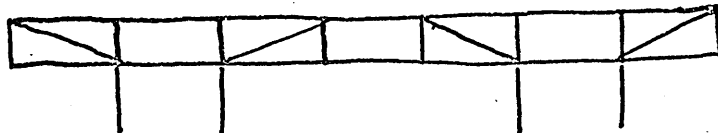
Habitable truss: i.e., its depth is a use-dimension,



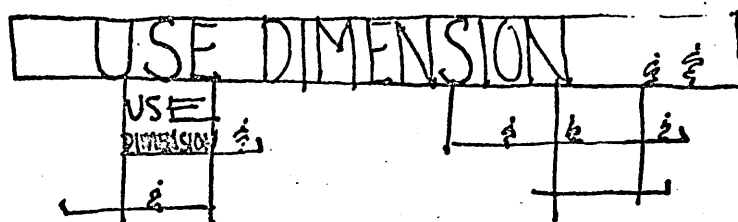
- *Span can be 10-15 X depth.
- *Distance "A" between struts must be 2X depth or less.
- *Middle third can be free of diagonals.
- *Cantilever possible up to $1/3$ span if no addition is to be made, up to $1/5$ if growth is expected as a continuation of the same level.



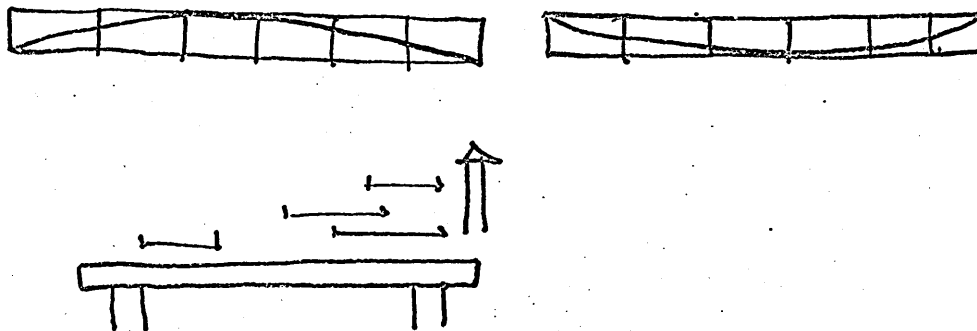
If the points of support are not at the ends, then the bracing or strut pattern must adjust accordingly:



By using spaced supports rather than single, more massive supports, they can be made habitable:

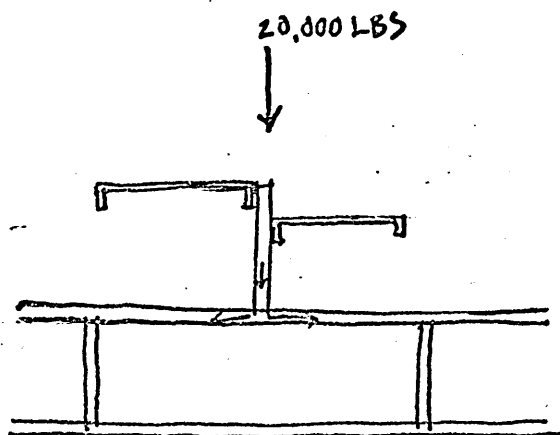


There are, to be sure, serious constraints upon the possible uses of the guts of the truss or platform, but it is usable space (usable by people, not just hot air and electrons) and there are some degrees of flexibility possible within this non-system.

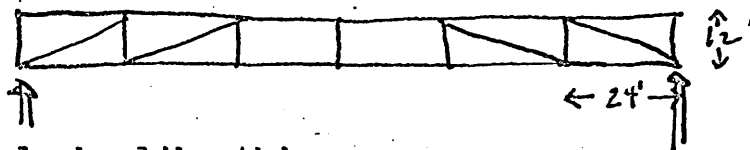


The depth is a function of the span, so increased loading means only more material in the supports.

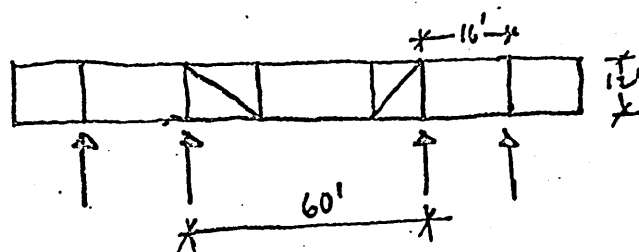
Carrying out ball-park calculations for sizes of members of this truss indicates that beams reach a depth of something like 14", which is not excessive--and still allows lateral movement through the truss. These calculations do indicate, however, that mid-beam loading on these platforms should probably be from no more than one story of built stuff, which might mean about 20,000 lbs. per column.

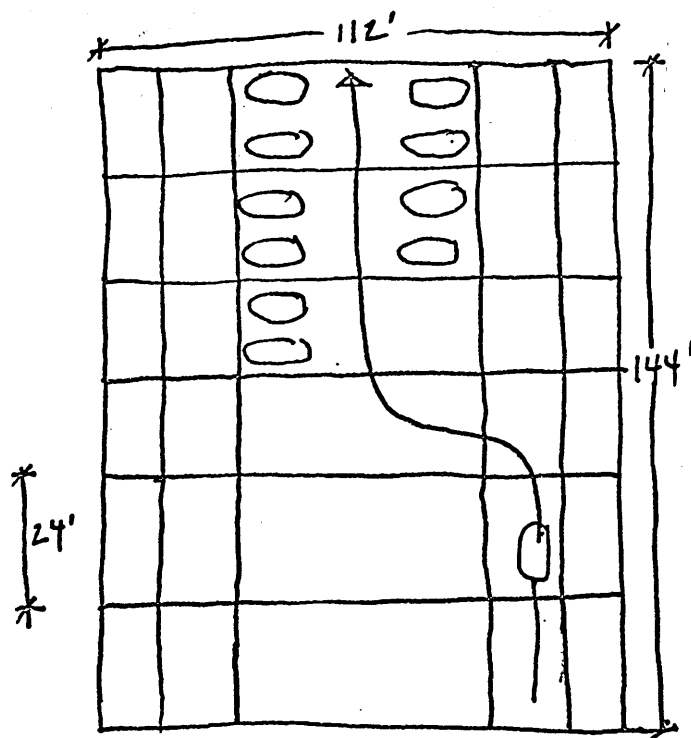


I have used a standard dimension of 144' x 112'. This means that with supports at the end, the truss looks like this:



The short side looks like this:





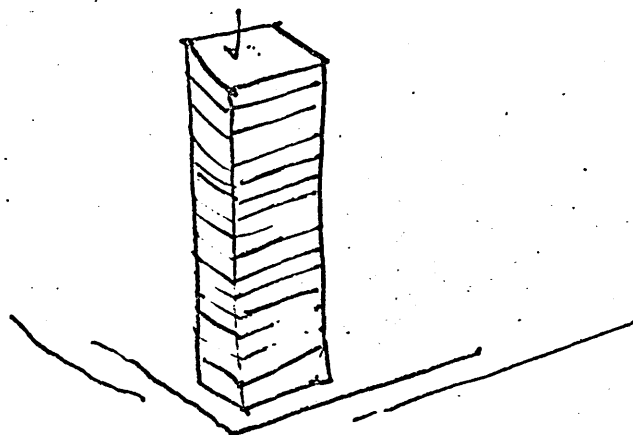
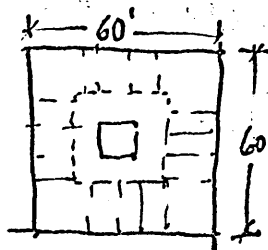
Using a minimum 29' turning radius, parking can be accomplished with plenty of leeway. Using only the center 60' each platform could accommodate a maximum 24 cars in its innards. The 16' between the main trusses provides access. The turn is made in the center, where there are no diagonals.

It is also possible to park cars on top, so the upper limit of parking capacity is about 60 cars. This sets a limit upon the kind of life which one of these "mega-forms" can support. For example, if each family has one automobile, then a maximum of 72 people can live in association with each truss (considering only parking inside the trusses and figuring three people per family.)

As a rough (minimal) figure, the NFPA figures 125 sq. ft. per person in apartment buildings. This means that as a bare minimum, 8750 sq. ft. would have to be provided to house 72 people. The total area of the platform is 16,128 sq. ft., so the square footage needed for housing (using only the inside of the platform and one car per

family) is about $9/16$ of the total area of the platform. With 12 more cars parked on top, 108 people can be housed and $27/32$ of the surface area is needed for housing. I am using this area as a means of comparison only; I am suggesting that the housing be built on top of and hung from the platform, saving its larger surface for uses which demand larger dimension (not housing.) The housing should be conceived of as a barnacle-like encrustation, in a loose unsaturated lattice, of the larger "megaform."

Using six platforms overlapped, as I have done in this scheme, one might be able to house 600 people. (This means excluding those whose parking and services are on the actual ground: the first three stories up from the ground.) In order to do this in a traditional way, using, for example, a square 60'x60' plan with 22 rooms per floor (27 people) one would need a 22 story building.



Of course, with the 22 story building, only 3600 sq. ft. of ground is covered. The platforms would shade 84,000 sq. ft., though they would not actually build all of that. The

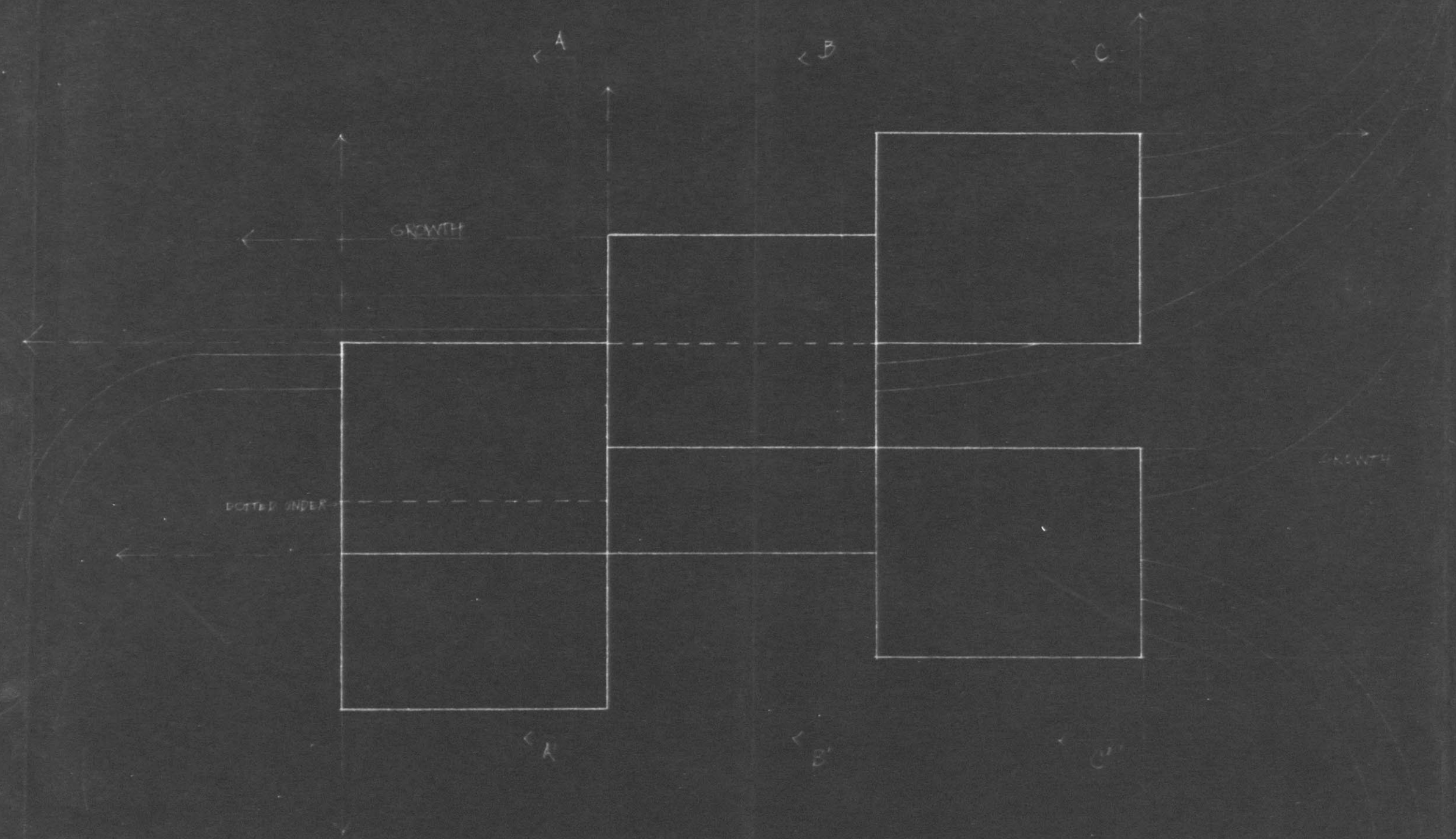
space underneath is free and has not been included in my calculations. Parking is not sanitized, buried at some remote distance from the housing. The relationship to one's car would be much like it is in three and four story paartments off the street. Parking for the 22 story building is not included in the 3600 sq. ft. either, so the relative areas are not exactly comparable. Using the same ratio of one car for three residents (a relatively high figure, since in urban areas a ratio of one car to every two to four apartments is sometimes used) 70,000 sq. ft. of parking would have to be provided. This brings the area figures back into focus and points out possible advantages of the "megaform." 73,600 sq. ft. chewed up (with all parking on one level) versus 84,000 sq. ft. built over. F.A.R. is not an extremely meaningful measurement in this situation, but overall I estimate it at between 1 and 1.5.

The utility of this approach is more obvious in certain other situations: poor soil conditions, swamps, etc.; rocky, impossible hillsides; over highways; over industrial waste lands; partially over built-up areas.

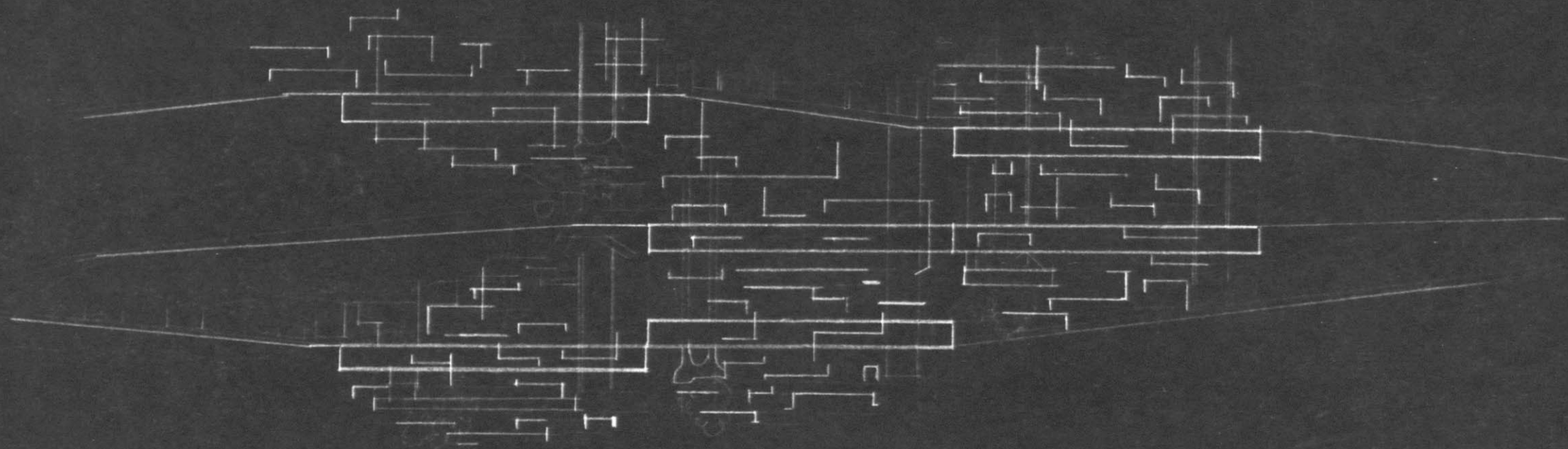
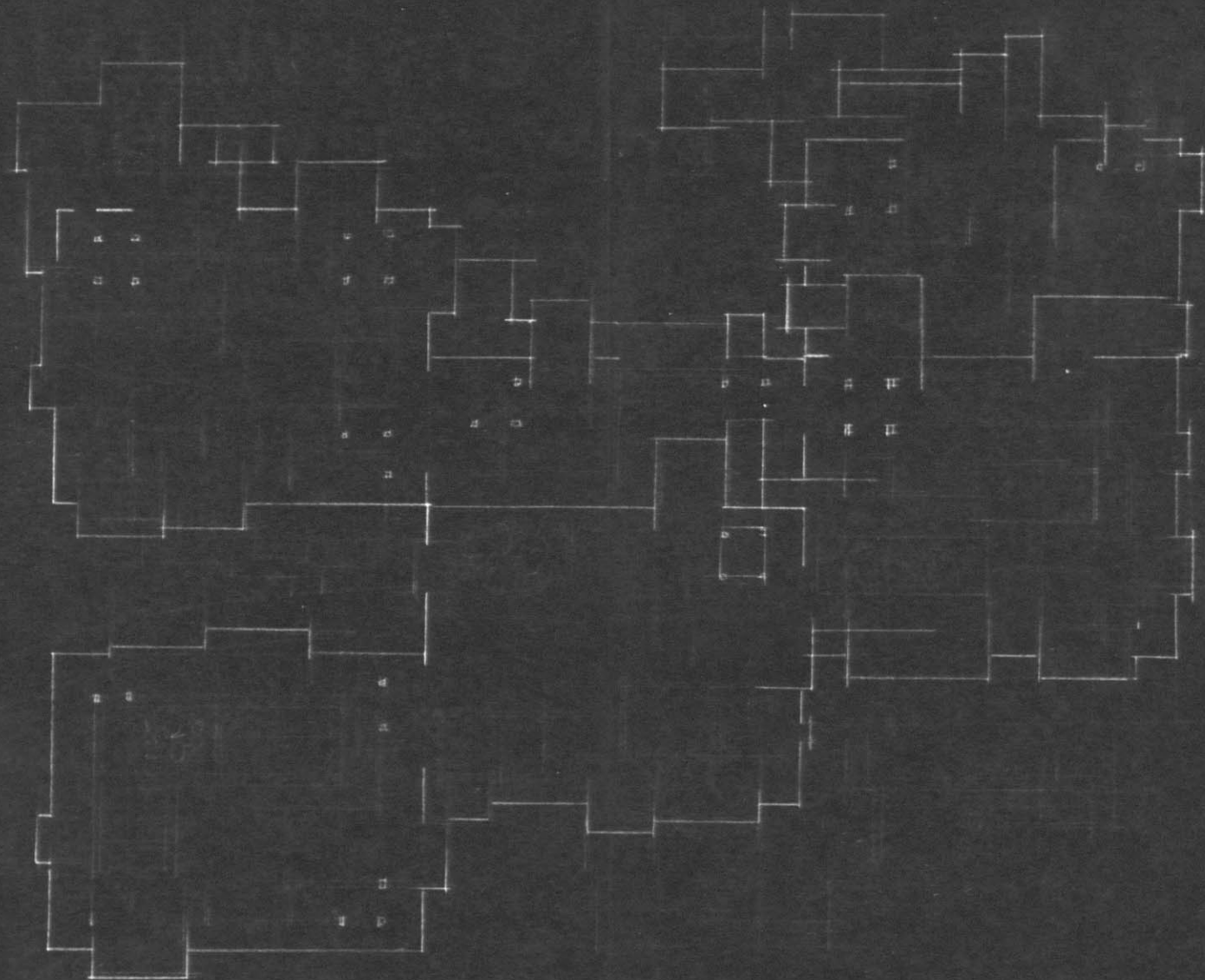
As with all building methods, however, the technology is less important than the way in which it is used. No physical system can insure quality. No modular box represents the salvation of the physical environment. The idea in using this non-system is to make it loose, open

changeable and growable. This is easier to accomplish if things do not have to fit, if the non-system can accept a variety of technologies in various degrees of overlap.

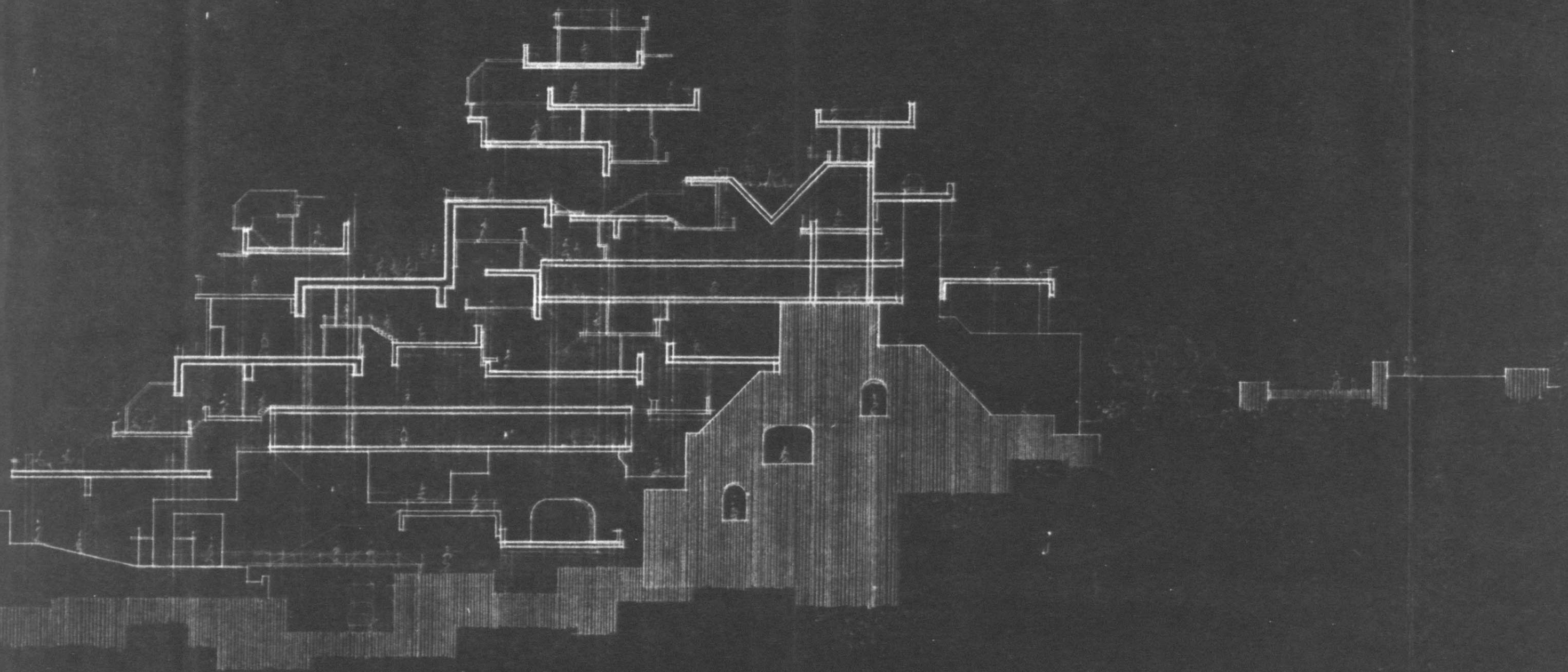
Plan of basic
structure



site plan

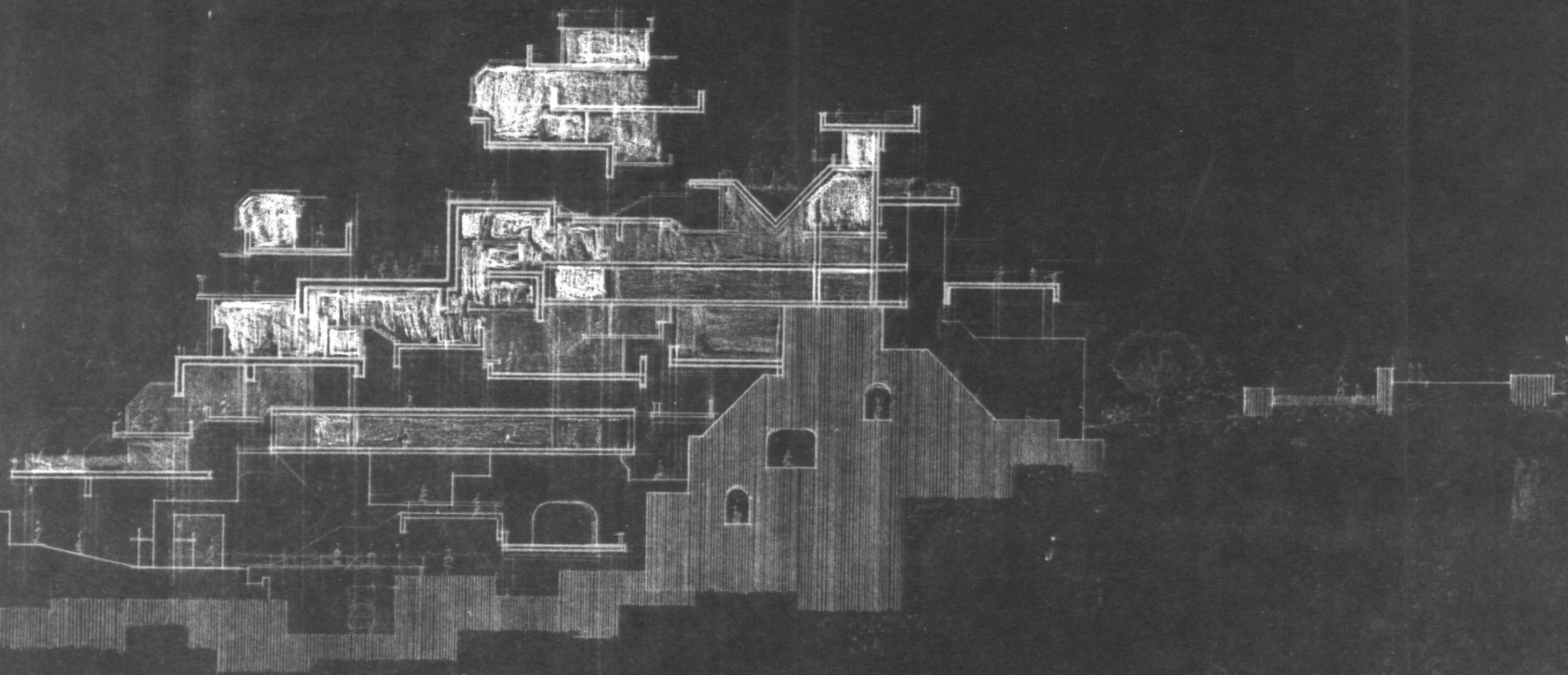


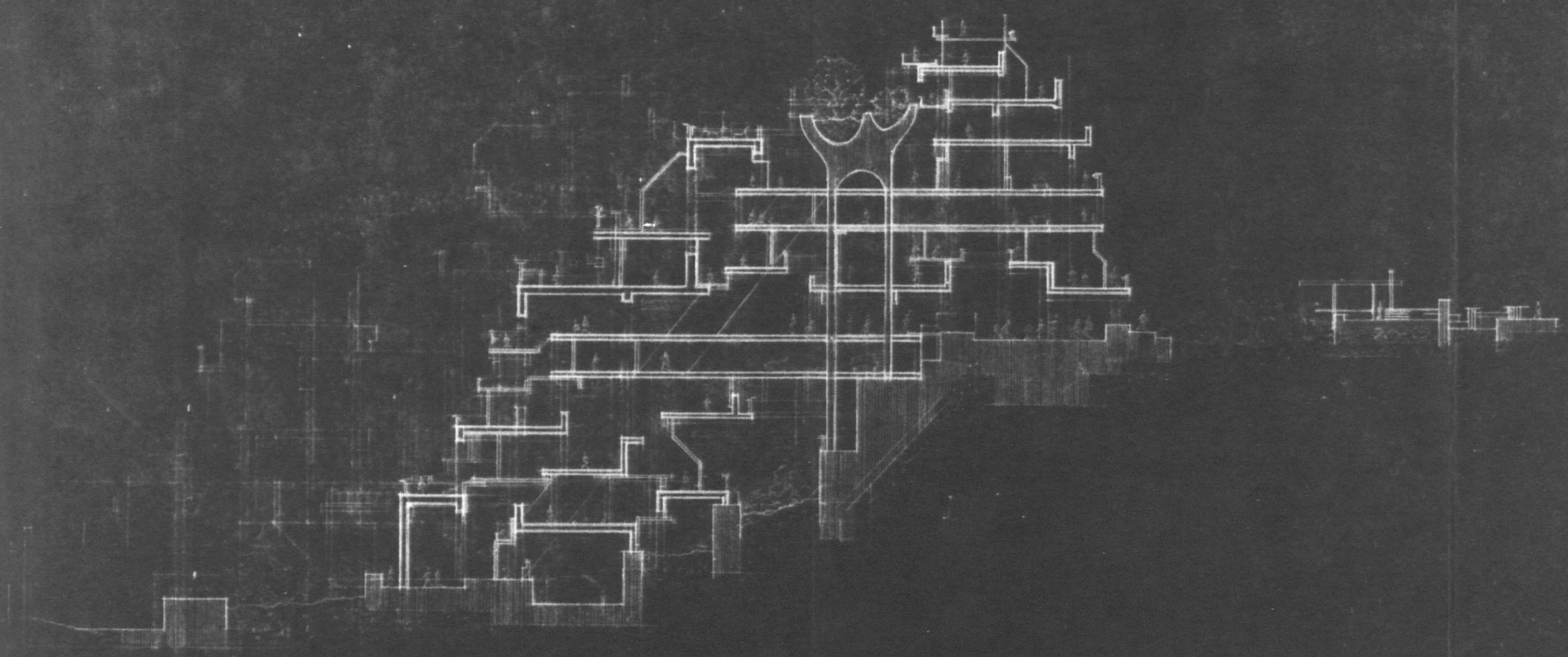
section A-A'



SECTION A-A
SCALE 1/32" = 1'

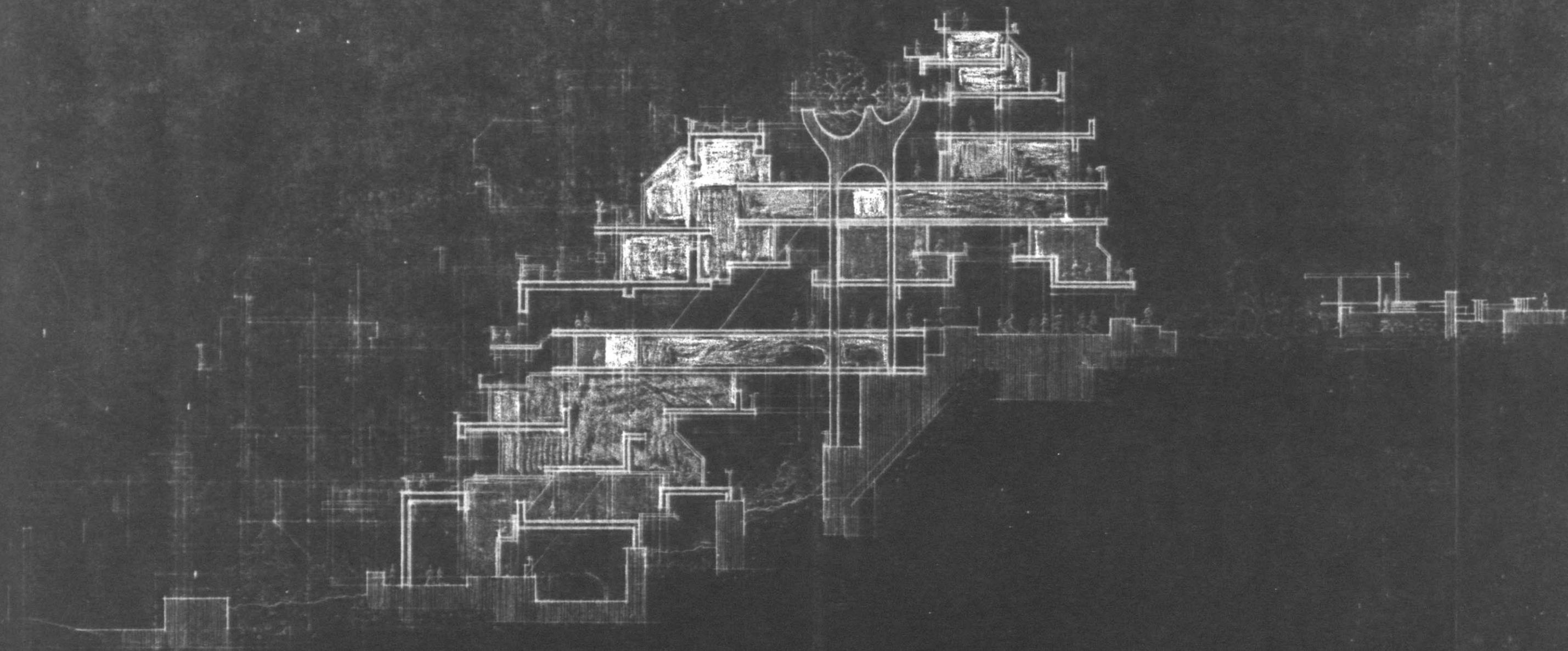
section A-A'
use code



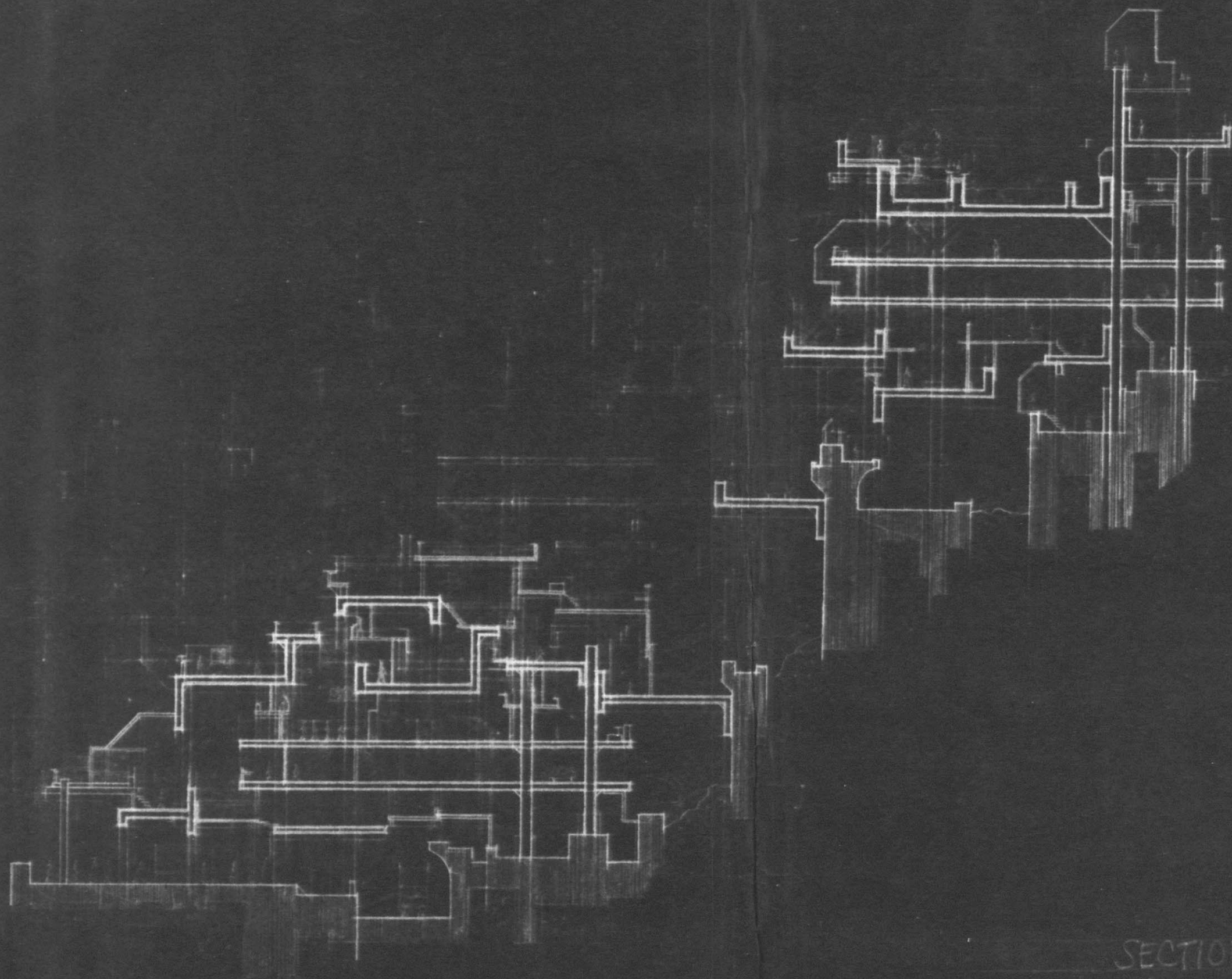


SECTION B-B
SCALE 1/32" = 1'

section B-B'
use code

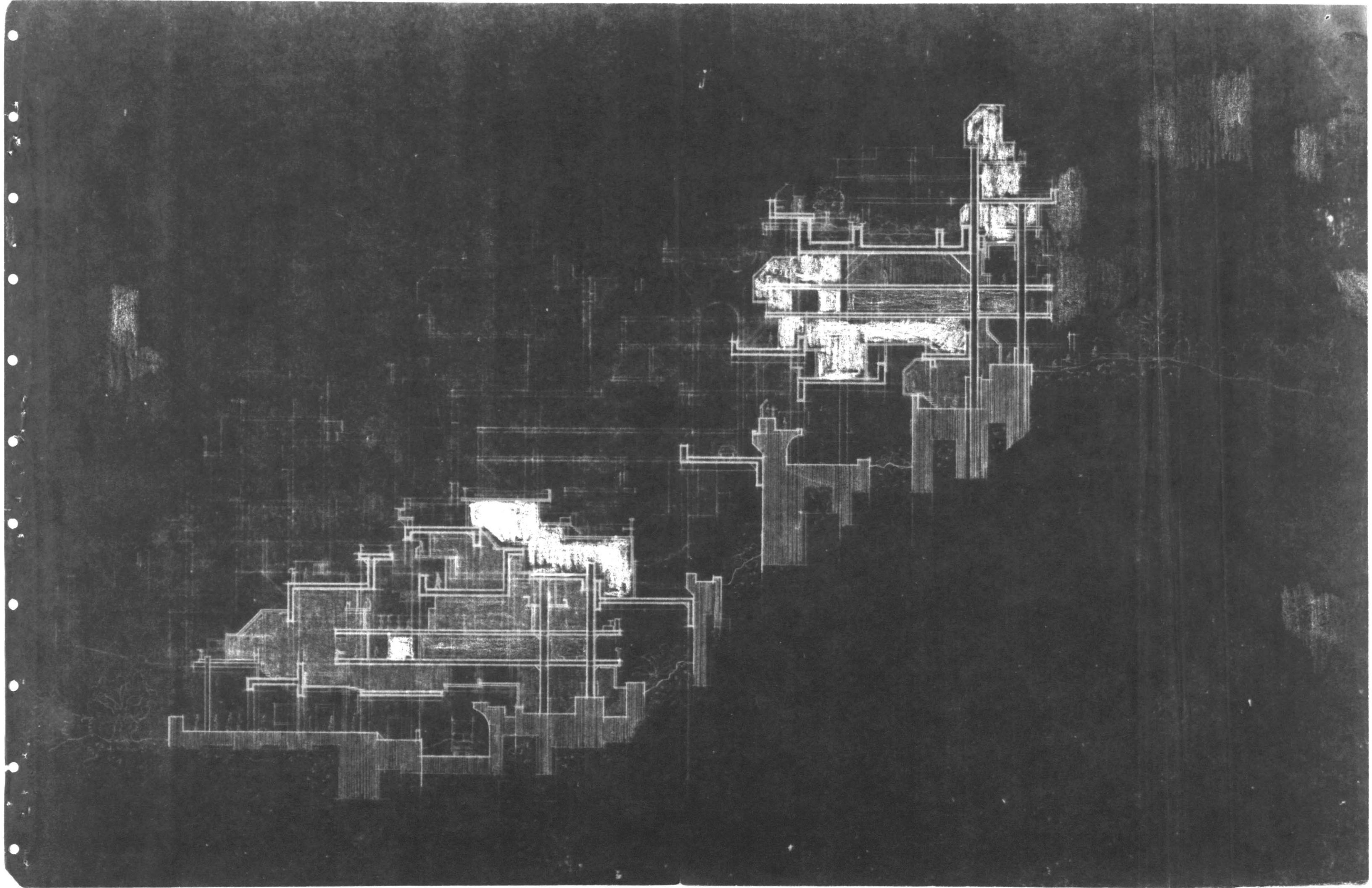


section C-C'

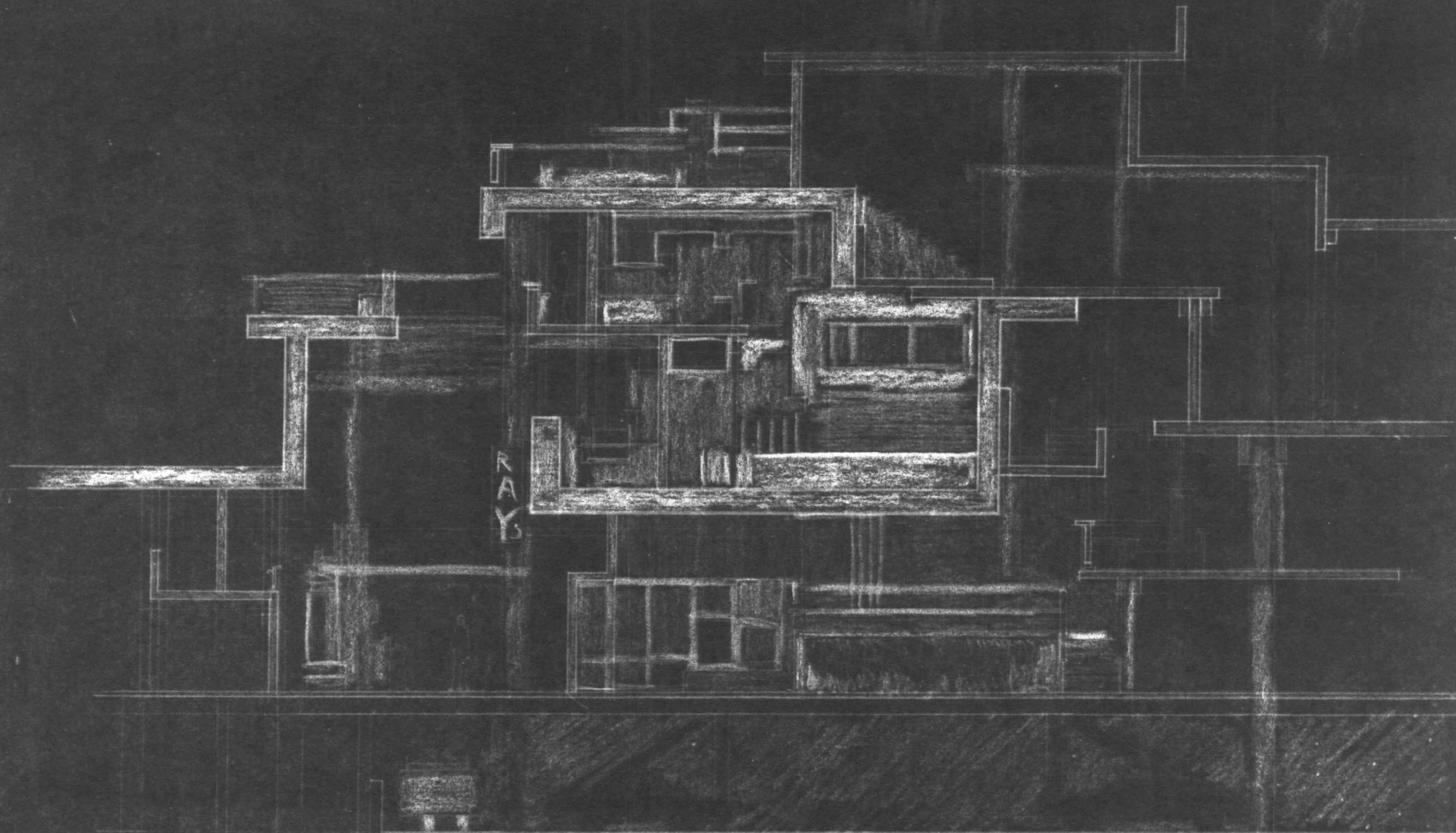


SECTION C-C
SCALE 1/8" = 1'

section C-C'
use code



portion of
section C-C'



PORTION OF SECTION C-C
SCALE $\frac{1}{8}" = 1 \text{ FOOT}$